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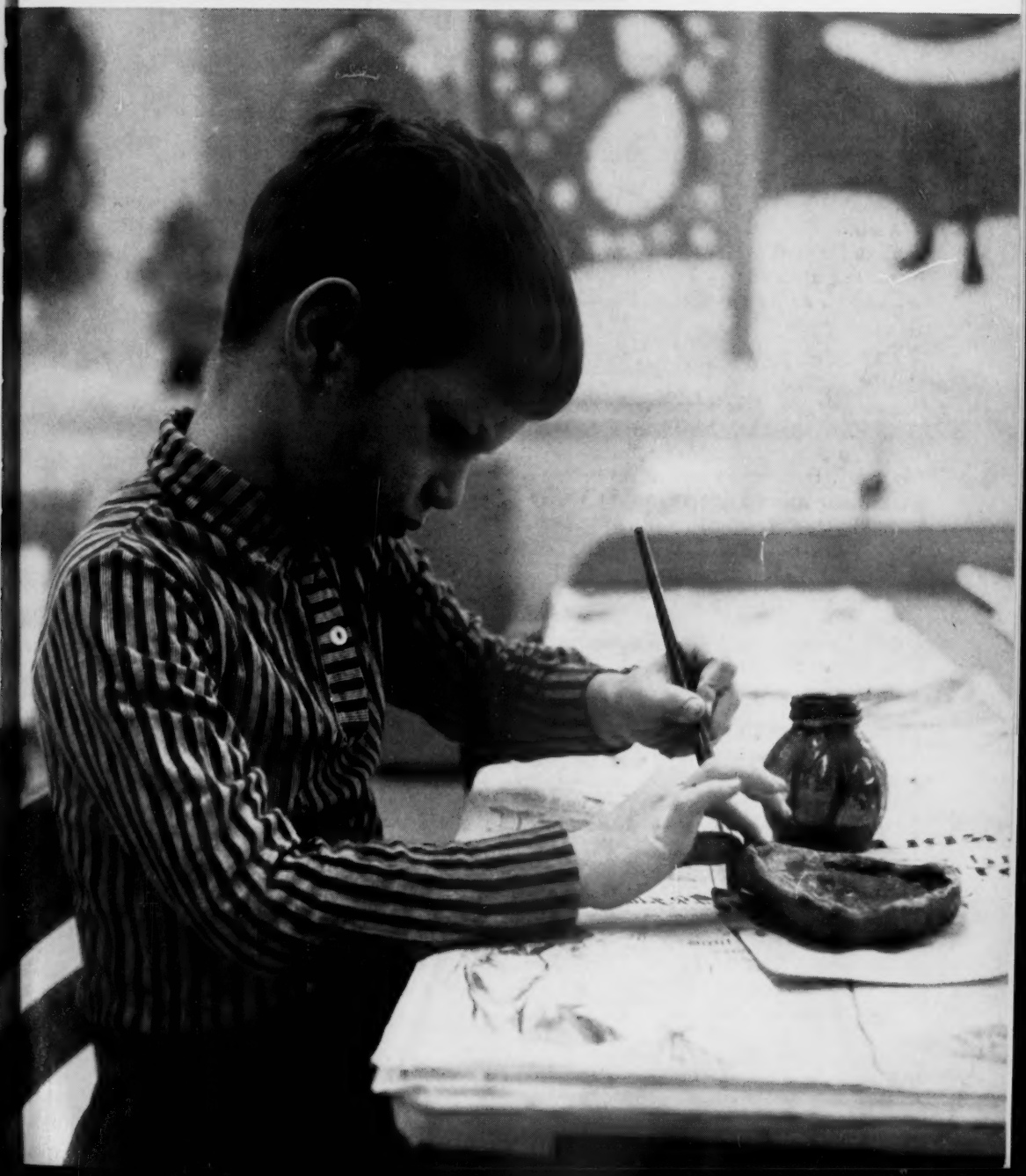

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Creativity

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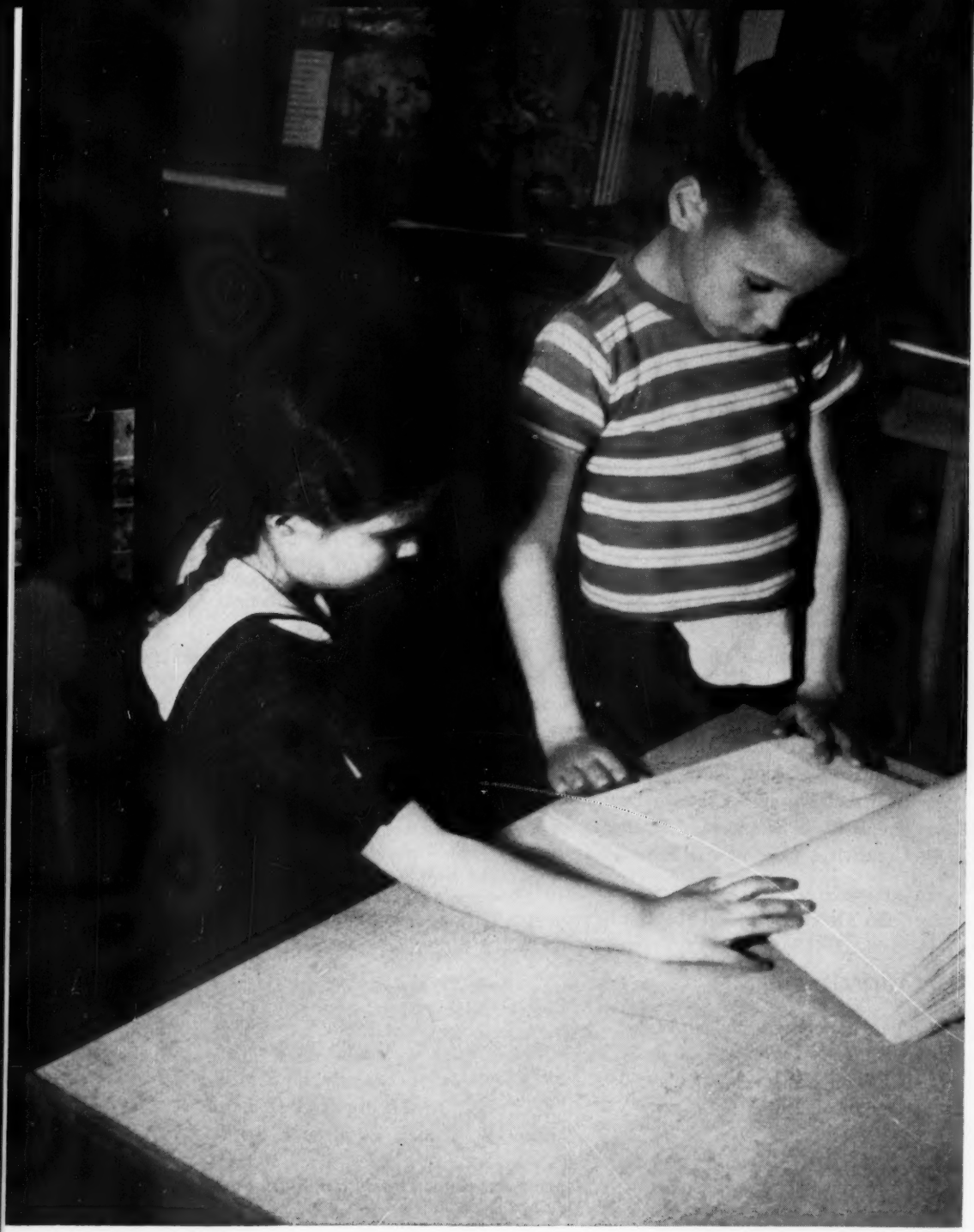

COURTESY E. PAUL TORRANCE, UNIV. OF MINN.

Poems by these third graders find a permanent place at the reading table.
(See page 13.)

Editorials

Robert R. Leeper
Robert W. Scofield

The Creator Is Himself Created

The creator creates and is himself created.[1]

A NEW volume of *Educational Leadership* deserves, we believe, a special introduction. This issue begins Volume 18. If this year's issues live up to the quality and effectiveness of those of preceding years, there is little question but that this volume will justify such an introductory statement.

Ten volumes, or eighty issues, of this journal have been added to our shelves and those of members and subscribers since the writer accepted a newly created position as full-time editor for the Association. Ten yearbooks and more than sixty booklets have been published by ASCD since then. The editor can affirm that these have been stimulating, challenging and busy years.

Several qualities seem to make work with and for our organization unusually rewarding. These are:

1. The wholeness and soundness of the professional tradition of the Association. Decisions are seldom expedient; they are based firmly upon principle and sound practice.

2. The quality of creativeness and inventiveness that pervades the service program of the Association. New items call for new adjustments. Such changes are constantly being made in the conferences, publications and other services of the Association.

3. The liberal, future-oriented outlook of the Association's leadership. In a professional organization made up largely of leaders, the elected officers and representatives of ASCD regard leadership as a function of the situation rather than as a status prerogative.

4. The willingness of members and others to contribute their professional work to and through the Association. This unselfish devotion of thought and effort is a treasured resource of our voluntary organization.

5. The freedom and responsibility that enable the Association members to think, to communicate, to take action as competent professional persons. Our service program reflects this freedom and responsibility. We welcome responsible discussion and action.

Before coming to work for the Association, the editor formulated several beliefs regarding the content of professional publications of a voluntary organization such as ours. He recommended that in such publications:

1. There should be content that will be of help to educators in their own personal and professional development.

[1] Marie I. Rasey. "Creativity and Its Psychological Implications." *Educational Leadership* 13:288, February 1956.

2. There should be content that will help educators meet more adequately the needs of children and youth.

3. There should be content that will help educators meet more effectively their responsibility as citizens of the locality, state, nation and world.

Whether a particular journal can successfully provide such content may depend upon a fourth suggestion: That there be a continuing emphasis on cooperative planning and work, involving members, subscribers, editorial staff, officers and other representative persons, and any specialists who may give needed assistance. This manner of working together seems to offer greatest promise of continuing improvement in the quality and effectiveness of the content, whether of *Educational Leadership* or of any other publications issued by our Association.

A Preview

We believe these four elements will be effectively represented in the volume that is here introduced. The October treatment of "Creativity" comes close to the heart of the struggle of our time as it discusses the genius of the democratic way of life—its ability to free and to foster the creativeness and inventiveness of the individual, whether it be child, youth or adult, as he lives in freedom and accepts, with others, his responsibility therefor.

"Issues and Prospects" in the elementary, the junior high, and the senior high school will be discussed in the forum of the November, December and January numbers. "Teaching Methods and Devices," the growth and application of technology in education will be treated in February. March will examine "Promising Practices in Continuity." April's central topic will be, "Grouping: Promising Approaches." May will discuss "Value Systems and Their Impact on Curriculum."

Several changes have been made in the editorial structure of the journal. In a continuing effort to adjust content to readers' needs, several articles in each issue will develop the special theme of the month, while some will be directed toward giving even more practical help to the instructional leader at work with teachers, principals and students.

Changes also appear in the continuing departments:

"The Importance of People," founded by Ruth Cunningham, and the long-time favorite of journal readers, now comes under editorship of Prudence Bostwick.

"Significant Books," coordinated by Elizabeth Z. Howard, continues its reviews of new books and booklets.

"Curriculum Developments," a new column combining reports of curriculum news, bulletins and research, is edited by Arthur Hoppe.

Initiated also is "Ideas into Action," a column that will report significant forward steps on the part of ASCD's Commissions and Committees. Since these are the groups that are set up to explore new concerns and developments and to advise and instruct in the on-going work of the association, this new column will have much interest for journal readers.

The words that open this editorial, spoken by a great American educator, almost as a valedictory to her beloved profession, are applicable here: "The creator creates and is himself created." The ideas expressed in this journal and in other publications of our Association are created by competent persons who, in their turn, are created by these ideas. This seeming paradox may be illustrated in history by the creation, over a long

period, of the idea that "man is born free and equal." Man-in-bondage created this idea, and the idea in turn helped create and shape the free man.

May this new volume, following in a proud tradition, be created by inspired and responsible persons who, in turn, will be created by the great and worthy ideas that will be expressed and discussed in the forthcoming issues. This is the hope and the challenge of a new beginning. This is the only hope that can make us worthy of the forum that is still our heritage at the dawning of the space age.

—ROBERT R. LEEPER, *Editor*, EDUCATIONAL LEADERSHIP.

A Creative Climate

WITH today's tremendous impetus toward creating new products, new ideas, and new and frequently bizarre approaches to problems and solutions, the school faces a most formidable problem. It is a problem not only of keeping pace with these new accomplishments, but also of helping pupils develop into adults who can contribute to further explorations in the creating of ideas. For, the creativity of the future will be found in tomorrow's adults—and these are today's pupils.

Creativity, psychologically defined, is the idiosyncratic perception of new intellectual relationships never before experienced by the individual between two or more stimuli. In lay terms this means that when a pupil gets insight into a relationship of facts which he never knew before, and he does this all by himself, he has been creative. This is true even though this relationship is quite well known to the teacher or to the whole adult world. Further, it is true for mathematics, science, and history as well as music, art, and drama.

For instance, when, in the process of adding two objects and two objects making four objects, Johnny perceives all by himself that if he removes two of these objects from the total of four he will have two left, he is indeed being creative. He has perceived a new relationship between the objects (subtraction) by his own intellectual efforts. He had not read it; teacher had not taught it to him or put it on the blackboard; mother had not told him. He just figured it out for himself. Here is the kernel of creativity.

Recent experiments and researches have demonstrated that all students, even mental retardates, can be creative. True, some of these creations were not world-shaking; yet, each pupil produced it himself, a notable achievement. However, some bright students, creating quickly and profusely, attract our attention with their insights, thus leading to the erroneous conclusion that this type of student is the only one who can be creative. Oftentimes, however, the bright student is not creative, indicating that other factors than just high mental ability lead to creativity.

Indeed, to be creative, the student must *want* to be creative. He not only must be curious, but also must be unfettered by anxieties concerning exploration, thinking ahead, thinking differently, and deriving new and strange conclusions. The pupil who is nagged by anxieties and fear of punishment for having thoughts or ideas different from those the parent or teacher can give him can hardly be creative. Imitating rather than

thinking, he limits himself to nice, safe thoughts and ideas supplied by them which will win their approval. The creative pupil, on the other hand, feels free to try new ideas, conclusions and answers. He has few anxieties concerning new relationships; rather, it is exhilarating and rewarding.

Since the teacher sets the emotional climate of the classroom, his personality is also an important element in implementing creativity. Can he feel free to encourage his pupils to attack problems creatively or is he restrained by anxieties over what will happen unless the class members keep together and do exactly as he tells them? To establish an emotional climate conducive to creativity, the teacher himself must feel free to encourage exploration, curiosity, varied approaches to problems, and, above all, trial and error experiences by his pupils. Supposing a teacher wanted to help his pupils learn this freedom of inquiry and become creative. How would he effect it?

First, recognizing individual differences, he would encourage pupils to progress at their own pace. Mary does not have to keep up with the class, just as Billy does not have to be tied down to the class. The lockstep method of keeping everyone on the same thought and page stifles creativity.

Second, he would feel free, himself, to permit varying approaches by his pupils to the subject matter. Nancy can approach decimals by reducing cooking recipes, her real interest; David can compute basketball standings and percentages of baskets made, his main interest; Joe can make a scale model of a hot-rod, his true love; meanwhile, Phyllis is still on fractions, not yet ready to undertake decimals. If it is threatening to the teacher that each is doing something different, his reaction may lead him to impose rigidity and conformity on his pupils, throttling creativity.

Third, he would permit students to struggle with a problem, try different resources and tentative solutions or conclusions, and experience the final exhilaration of solving it themselves. Everyone is familiar with the child's frequent assurance, "I can do it by myself." Children love to do puzzles and conundrums. Here is the very essence of creativity: the practice and experience of pupils' bringing facts into new relationships on their own. Their doing this, in spite of any unpleasantness of the struggle, leads to feelings of security for exploring and satisfying curiosity. The pupils learn that it is all right to create their own conclusions.

Fourth, the teacher would deemphasize any need for immediately giving the one and only "right" answer but would encourage many trial answers. This does not mean that a correct answer is unimportant or that any answer is correct. Rather, it means that the teacher would refrain from rushing in with the correct answers until his pupils have had freedom to explore the facts and try tentative answers. Thus, by emphasizing learning rather than being right, by encouraging responses rather than limiting them to the one correct response, this teacher would be providing the experiences necessary to produce creative thinking.

Fifth, the teacher would refrain from giving punishment in any form for each attempted incorrect response. Inappropriate or incorrect responses, of course, should not be allowed to stand; but, neither should such responses be rejected by use of emotional punishment. Correction of incorrect responses comes most

(Continued on page 49)

Calvin W. Taylor

The Creative Individual: A New Portrait in Giftedness

Our task—
to develop "tomorrow minds"
rather than "yesterday minds."

A MAJOR problem facing educators is to speed up the application in education of research findings from pertinent fields. Basic research results with implications for education should be communicated so that these findings can be tested in the educational setting and incorporated if relevant and effective.[1] In this paper I will attempt to transmit some of the research findings on creativity to date.

My research interests have been in the relatively unsolved area of seeking the creative more than in the traditional area of seeking the gifted. The word "gifted," as typically used, is closely tied to the current intelligence tests, but quite different tests are usually being used in a search for the creative. As I describe this approach to others, they usually expand their meaning of the word "gifted" to include the creative. Nonetheless, some points should be made by contrasting intelligence, as measured by the traditional type of IQ tests, with creative talent.

[1] In a current cooperative research project with the U.S. Office of Education, we are searching for relevant research findings from psychology and other fields that have implications for education.

The traditional intelligence tests cover only a very few of the fifty or more dimensions or characteristics of the mind discovered to date. Consequently, there may be several types of intellectually gifted other than the IQ type, even though the IQ type may be closely tied to current academic activities and to the grades that measure success in the academic world.

Several Types of Gifted

In focusing on other areas of giftedness, one should be forewarned that there may be several different types of creativity. In addition, there are probably several other types of gifted, relatively separate from the IQ type and the creative types. Other types may be found in each of the areas of planning, communication, and evaluation or decision making activities. A similar paper could be written, at least tentatively, on each of these other types of gifted. Likewise, in certain of these areas, such as the communication abilities area, where we uncovered a sizable number of different dimensions in each sub-area of reading, writing, speaking, and listening, there

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may also be several different types of giftedness.

In transmitting new research findings on the intellect, difficulties arise because 40 or more new intellectual characteristics have been discovered which have been excluded from the so-called intelligence tests. The current tendency is to classify these new characteristics downward into a lesser category called "special abilities," even though they really parallel those that were earlier incorporated into the so-called intelligence tests. The human characteristics that psychologists have been able to measure first are not necessarily the only important characteristics. Some of the remaining characteristics which had been postponed for later measurement may often be extremely important characteristics. We had just not known any way in which to measure them earlier.

To me it is highly inconsistent to conceive of the mind as being represented by a single score or even by only a handful of scores or dimensions that are present in our current intelligence tests. The brain which underlies the mind is far, far too complex to hope that all of its intellectual activities can be represented by only a single score or by only a handful of dimensions. It is an insult to the brain and human mind to allow this oversimplified viewpoint to survive.

Emerging evidence from several sources suggests that many important high level abilities are not only missing in our searches for talent but are also being largely ignored in the education and development of our youth. Let us be flexible and toy for a moment with our present situation. If a creativity index had been established first in our schools, we might now be putting forth the same type of arguments to make room to add an intelligence type of index if it had been largely ignored to date.

Results to date indicate that creative talent is not measured well by the use of IQ tests. In our three Utah conference reports on creativity there are several indications that creativity scores and IQ scores are, at most, only lowly related. The nature of traditional intelligence tests does not directly involve the ability to create new ideas or new things. The abilities needed in sensing problems, in being flexible, and in producing new and original ideas tend to be *unrelated* or to have only low relations with the types of tests entering into current measures of intelligence.

Perhaps one reason why our society does not give much moral and tangible support to education is that persons leave the academic world and find, to some degree at least, that intellectual characteristics in which they are highly trained are not called for in the world of work as much as they expected. Contrarily, other intellectual characteristics in which they have had little training may be crucial characteristics in their part of the world of work.

Some indirect evidence that key people in school systems are not necessarily seeking for or encouraging creativity is found in the report by Frank Jex at the 1959 Utah conference. A group of high school science teachers were tested with a "creativity" battery when they enrolled for a year of graduate study. Their creativity scores were correlated with their principals' or supervisors' ratings of their over-all teaching ability, as judged during the previous year. The correlation was —.38. This result suggests that teachers with certain creativity characteristics may be looked upon with some disfavor in certain educational settings. A study is

needed to determine whether those teachers develop creativity traits in their students more than other teachers do.

Utah Creativity Conferences

My remarks on creative characteristics will be based largely on research reported in the three (1955, 1957 and 1959) University of Utah research conferences on the Identification of Creative Scientific Talent. In the three conferences, 37 different nationally-selected participants presented a total of nearly 50 reports, covering various sub-areas such as criteria of creativity, predictors of creativity, education and training of creativity, and working environments that affect creativity. NSF supported these conferences.

The main research approach to date has been to study creativity in full bloom in adults with the hope of tracing these characteristics back to their earlier budding stage. Many leads are available from this approach that could be tried on children. An alternate approach, which may be at least equally promising, is to study creativity "in its more natural state" in children before it may be curtailed, distorted, and even blotted out by various features in our world.

Ghiselin suggests that the measure of the creativeness of a product of the mind should be *the extent to which it restructures our universe of understanding.* Lacklen indicates that the Space Agency judges the creativeness of the contributions of scientists by determining *the extent of the area of science which each contribution underlies,* so that the more basic a contribution, the wider its effects. In a study of creativity on the job, Sprecher was interested in both the novelty and the value of the ideas and other products produced by scientists. In our studies of scientists on the job, after obtaining judgments of products, judgments of processes, and over-all ratings of creativity, we found at least five separate types of contributions which, to some degree, could be called creative.

In research on the identification of creative talent, a broad approach has been emphasized, somewhat in contrast to the identification of the so-called gifted by means of a single (IQ) score. A broad coverage of intellectual, motivational, biographical, sociometric, and other personality characteristics will now be presented to illustrate the nature of creative talent and of current attempts to identify it.

Intellectual Traits in Creativity

From the research results of many workers, Guilford has evolved and listed the following intellectual characteristics as most likely to be valid measures of creative talent: originality, redefinition, adaptive flexibility, spontaneous flexibility, fluency of associations, fluency of expressions, fluency of ideas, fluency of words, elaboration, and probably some evaluation factors.

Speaking more broadly, some components of memory, cognition, evaluation, and especially convergent production and divergent production are involved in creative work. The divergent production area, largely overlooked to date in psychological measurement, is probably the most important in creative talent since it includes production of ideas in quantity and in quality, originality, flexibility, sensitivities, and redefinition abilities. Pictorial fluency may be an example of a characteristic needed more in creative work in art than in science.

Ability to sense problems is another intellectual characteristic usually included in creativity. It may also lead to motivational features. The capacity to be puzzled may be a very important characteristic. A rejection of superficial explanations and an ability *to know when you don't know* may be important in making original contributions.

Our verbal revision test is at least analogous to the manipulation, restructuring, and reworking of ideas found both in the earlier and later stages of the creative process. It is probably also related to the ability and tendency to strive for more comprehensive answers or solutions or products, another feature found in studies of creativity. Unfortunately, too few occasions in our academic programs require such strivings for higher quality or for more original and workable products.

Two response-set factors, which we have found, may measure characteristics functioning in creativity. The first one is called "*broadly diffused attention.*" This type of attention has often been a part of the description of the crucial moments preceding the insight stage of the creative process. The second response-set factor is described as a "*resistance to idea reduction.*" The opposite pole of willingness to reduce ideas may be valuable in creating broad new generalizations.

Other tests or test ideas that may have validity include the abilities to form and test hunches (hypotheses), to foresee consequences, to infer causes, to evaluate revisions in a product, and to be able to toss one's ideas into the arena of ideas. Our finding of a verbal originality factor leads us to hope for an analogous measure of *nonverbal originality.* Another hunch, expressed by Shockley, is that we should test how many ideas each student can manipulate at one time.

In summary, there are many relatively new and separate intellectual components in creativity. I have a hunch that many of the components of curiosity and of motivation are also intellectual in nature.

Motivational and Personality Traits

In this motivation area the great need is for good measuring instruments that will demonstrate the widespread conviction that motivation is a strong component of creativity. From our communication abilities research we feel that the ability to sense ambiguities, plus effective questioning ability, are a part of curiosity. Bloom has indicated that science students who truly become involved in research work and in the research role during graduate training, tend to become productive researchers afterwards. If the creative are to be found somewhere among the productive, then in science our problem will be reduced by finding those students who truly become involved in research problems during their academic career. Analogous situations entailing student involvement could also be sought in nonscientific fields.

Other motivational characteristics suggested are intellectual persistence, liking to think, liking to manipulate and toy with ideas, need for recognition for achievement, need for variety, need for autonomy, preference for complex order and for challenges therein, tolerance of ambiguity, resistance to closing up and crystallizing things prematurely coupled with a strong need for ultimate closure, need for mastery of a problem, insatiability for intellectual ordering, and a need to improve upon currently accepted systems. High energy with vast output through disciplined work habits is usually found.

McClelland suggests that the creative person may be willing to take a calculated risk larger (though not unrealistically large) than others and that his judgment of the chance of success is actually greater than the average judgment from other persons. The creative individual presumably does not want to deal in a sheer gamble situation but rather to engage only where his own efforts may make a difference in the odds.

Younger persons with creative talent, according to Getzels' findings, have a much greater interest in unconventional careers than do their fellow students. They sense that their views are not the predominant ones of what success in adult life is. They are also more willing to be nonconforming and to be in the small minority.

From personality evidence to date, creative persons are more devoted to autonomy, more self sufficient, more independent in judgment (contrary to group agreement, if needed, to be accurate), more open to the irrational in themselves, more stable, more capable of taking greater risks in the hope for greater gains, more feminine in interests and characteristics (especially in awareness of one's impulses), more dominant and self assertive, more complex as a person, more self accepting, more resourceful and adventurous, more radical (Bohemian), more controlling of their own behavior by self concept, and possibly more emotionally sensitive, and more introverted but bold.

Nearly every time that even a brief biographical inventory has been tried on creative scientists, it has been found to have promising validity in the initial sample studied. Our research team is currently studying samples of scientists locally, in the Air Force, and in the Space Agency with this biographical approach. This approach gets at work habits, attitudes, interests, values, family and academic history, and several personality characteristics.

Some Final Comments

Clues for spotting creative talent may be obtained by watching the reactions of others around a person. If some persons in a group appear excited, disturbed, or threatened, *perhaps* there is a creative person around whose ideas and work are being at least vaguely sensed as threatening the present scheme of things. Group behaviors which try to reduce this threat, include a developing of *sanctions against* the person and an over-organizing and building of other controls into their world, as found by Torrance. On this point the creative persons may most appreciate the necessity of a few very good rules in an organization. Contrarily, they may be most sensitive to unnecessary organizational controls or other rules that are built in by administrators or other people. The creatives may be those who try to work their way out of such needless restrictions.

As one Utah conference participant reflected upon those *rare* persons whose work had truly reshaped the world, he observed that nearly all of these individuals had eventually done their work outside of an existing organization. They were neither supervisor nor supervised. Organizations that are effective either in transmitting or implementing ideas should not automatically be assumed to be the types of organizations best suited for creative work.

Another major concern in creativity is with restrictions, inhibitions and deterrents within a person as contrasted with freedom within him. These restrictions, often self-imposed or built in through the

influence of others, can thus reduce the freedom and potentialities of a person and may even block his efforts that would otherwise lead to creative performance.

Until shown otherwise, I believe that quite different psychological processes are involved when we learn existing knowledge and systems than when we produce new ideas, new knowledge, and new systems. Education may teach people to recite the past and repeat past performances more often than to prepare them to develop new things or even to be ready for new developments by others. Too often, strong fears rather than positive abilities emerge when opportunities arise to take a new step forward, to pioneer at the frontiers. The sheer amount of education is probably not a good basis for identifying those ready to take a new step.

We should identify and develop people who can learn the past without worshiping it, who can mentally toy with and manipulate man's knowledge and ideas and products of the past, who can use the past as a springboard for future developments, and who can find and use new leads to improve upon the past. In other words, maybe our task is to identify and develop more minds that are "tomorrow minds" than "yesterday minds."

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The Self-Contained Classroom

Edited by Edith Roach Snyder

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94 pages Price: $1.25

Available October 1960

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E. Paul Torrance [1]

Creative Thinking Through the Language Arts

Three approaches to developing creative thinking are suggested.

"YOUR ideas are important! But their value is lost unless you record them—write them down. People have their best ideas at the funniest times and places. In fact, many of the world's greatest inventors and scientific discoverers say that their great ideas occurred to them when they were in the bathtub, in church, or just walking along. It pays to have an 'idea-trap'—a small note pad or something similar to record your ideas when they occur before they are forgotten and lost."

Value of Own Ideas

The above introduction to the third, fourth, fifth, and sixth graders of one elementary school marked the beginning of an exciting six-week experiment in creative writing. We hoped that through this experiment these children would be stimulated to do a great deal of writing on their own and form the habit of recording their ideas, something that children do not do naturally. Above all, we hoped that they would learn that their ideas are important and that others will enjoy them and find them useful, if they are recorded.

Each child was given a large brown envelope. This was to serve as the "bag" for the "trapped ideas." They were urged to write down their ideas for poems, stories, jokes, songs, opinions, inventions, and cartoons. Pupils were instructed: "If you think of an idea in the middle of an arithmetic lesson, you will not be able to write it out just that minute. You can jot down a few words to remind you of your idea later. Then you can pay better attention to your arithmetic work because your idea is safely trapped. Then, the first chance you have, you can write it out in detail."

On Fridays, I visited all classrooms and asked each pupil to select from his envelope the idea he thought others would enjoy most. Selections were then made for a weekly magazine named by the children *Ideas of the Week*. Every issue had an attractively illustrated colored cover, using drawings submitted by participants in the study. On Thursdays, when the magazine was delivered, the person making the delivery was almost

[1] The research described herein was supported in part by the U.S. Office of Education.

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mobbed, the children were so eager for copies. There was intense interest among the children, their parents and teachers, and the research staff.

To help evaluate the effects of this experiment, subjects were given a test story to write at the beginning and end of the experiment. Topics such as the following were suggested:

The dog that doesn't bark
The man who cries
The woman who can but won't talk
The doctor who became a carpenter.

A different set of topics was used for the pre- and the post-tests. At the end of the experiment, each subject was interviewed by the editor of the magazine and asked to fill out a brief questionnaire evaluating his experience in writing down his ideas.

The data collected have not yet been analyzed but several important conclusions are obvious. Children in the third through sixth grades can be stimulated to record their ideas on their own. All of this writing was done outside the regular curriculum of the school. No special time was allowed by the teachers, although they could write and illustrate their ideas when they had completed their regular work. Third graders were highest in productivity. Almost all contributed regularly, most of them writing down their ideas when they had finished with other work. The only noncontributors were a few slow learners who "didn't ever get through with their regular work." The least productive grade was the fourth. Many of the fourth graders confided to the interviewer that they didn't have enough time to write down their ideas, because it took all of their spare time to write 500 times, "I will not make noise in German class" or "I will not run in the hall." Productivity among fifth and sixth graders fluctuated. Some weeks they were just too busy to record their thoughts.

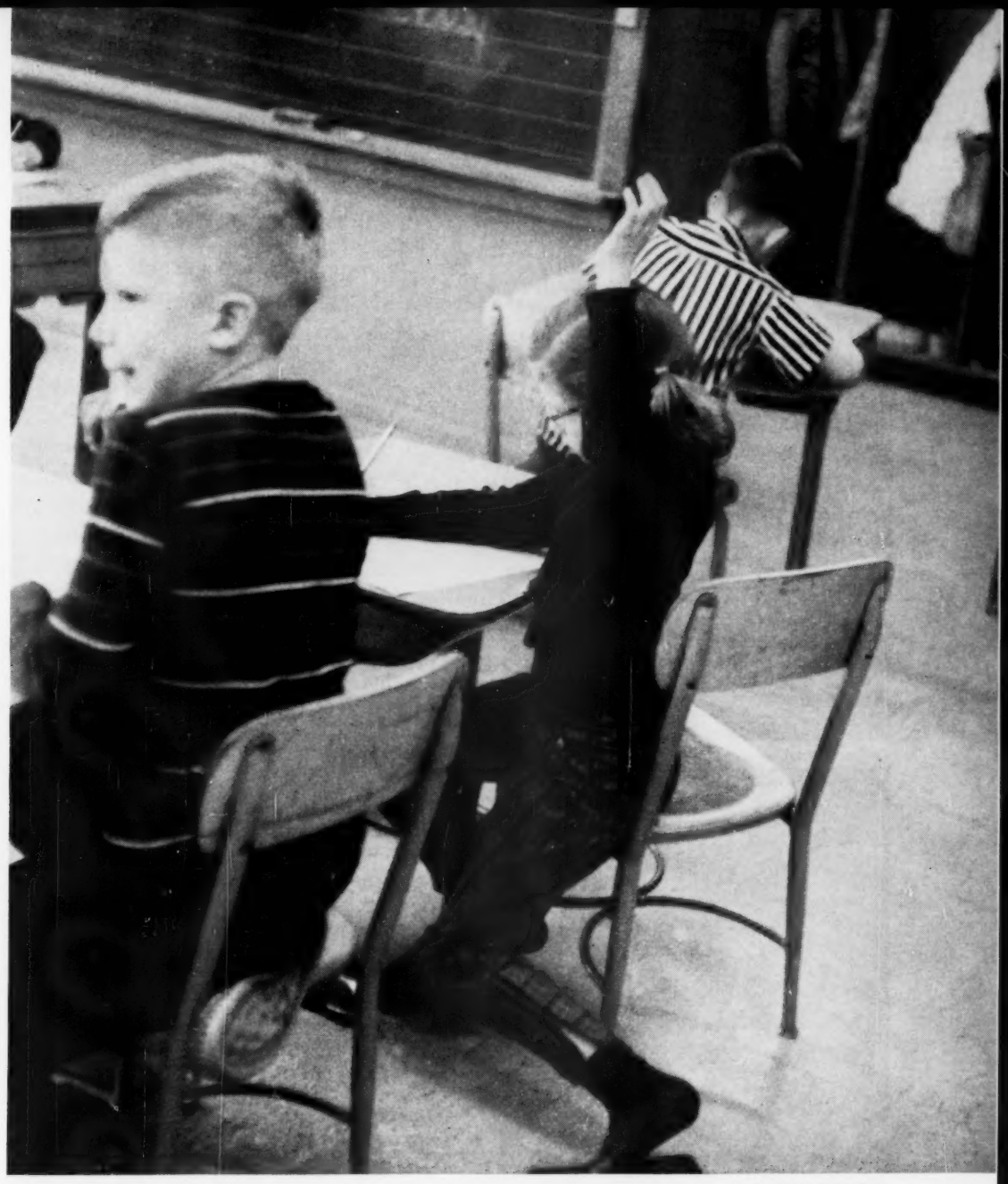
There were many evidences that the subjects learned to value more highly their own ideas and even the nonparticipants showed great enthusiasm for the ideas of their classmates. In fact, they accepted so well the notion that their ideas are important, that they objected rather violently to the small amount of editing done. During the fourth week, there were several irate complaints. The following by a fifth grader is a sample: "I don't think you should change our poems, stories, etc., around. I know you are trying to make them better, but sometimes the way people write things —no matter whether it makes sense or not—is the way people want them. . . . I thought you said our ideas are important but we are beginning to wonder if we are mistaken. Please try and understand the way we feel about it."

Many of the stories and poems gave us fresh insight into the emotional problems and conflicts of highly creative children. The symbolism contained in the following story of "The Green Pig," by a creative fifth grade girl describes what appears to be the essential problem of many children in the intermediate grades and causes them to sacrifice their creativity:

Once upon a time in a far-off land, there was a magic farm that no one has ever visited. Many different animals lived there. The odd thing about these animals was that they were different colors from regular animals.

The cows were pink, the horses were purple and hens and chicks were blue! All the pigs were green. That is, all except for one little fellow who was just plain pink. Nobody wanted to be near him because he wasn't green. And this little pig was very, very sad.

One day when he was walking along he saw a great big puddle of mud. He



COURTESY THE AUTHOR

Third graders like these engage with absorption and intensity in creative activities of almost all kinds. These children taking a creative writing test show their total involvement through motor activities, such as are shown by this unusually creative girl. If forced to sit with their feet flat on the floor and in neat rows, children like these would probably sacrifice much of their creativity.

splashed and rolled in it because he loved the mud. When the little pig came out of the puddle, he was all *green!* And he stayed green for all of his life. And all the other pigs began to play with him.

Developing Through Creative Activities

The experiment described here represents an attempt to develop creative thinking through more or less self-initiated activities. The subjects were stimulated to write on their own during their "spare time."

Another experiment conducted in 21 fourth, fifth, and sixth grade classes relied upon creative activities in the language arts as a part of the curriculum. Teachers participating in this study were given a 34-page manual, a collection of ideas for developing the creative thinking abilities through language arts activities. The manual was presented and discussed in a two-hour workshop and the participating teachers agreed to try out in their classes as many of the suggestions as seemed reasonable.

At the beginning and end of the experiment, pupils of the participating teachers and four control teachers were administered the same creative writing tests used in the first experiment. Language arts activities were suggested for developing each of eight abilities thought to be involved in creative thinkin. A 60-item check-list was developed to determine the extent to which the suggested activities were applied. The following are sample items from the checklist:

Ideational Fluency

"Brainstorming" as a technique for stimulating ideas, developing fluency of ideas, etc.

Practice in playing word games

Pupil dictation of stories, ideas, etc., on a tape recorder or other electrical recording device

Competition to stimulate fluency of ideas

Associational Fluency

Introduction to Roget's *Thesaurus*, some book of synonyms, or other word reference in addition to dictionary

Exercises in recognizing word relationships, words of similar meaning, words of opposite meaning, etc.

Spontaneous Flexibility

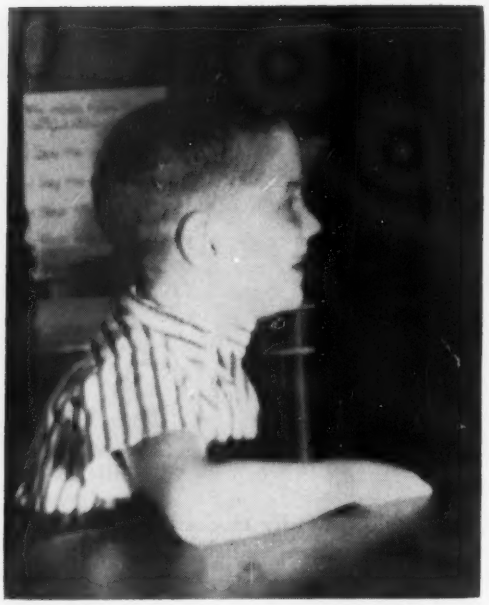
Having pupils think of new uses for some device or product

Having pupils think of many alternative solutions to a problem.

Adaptive Flexibility

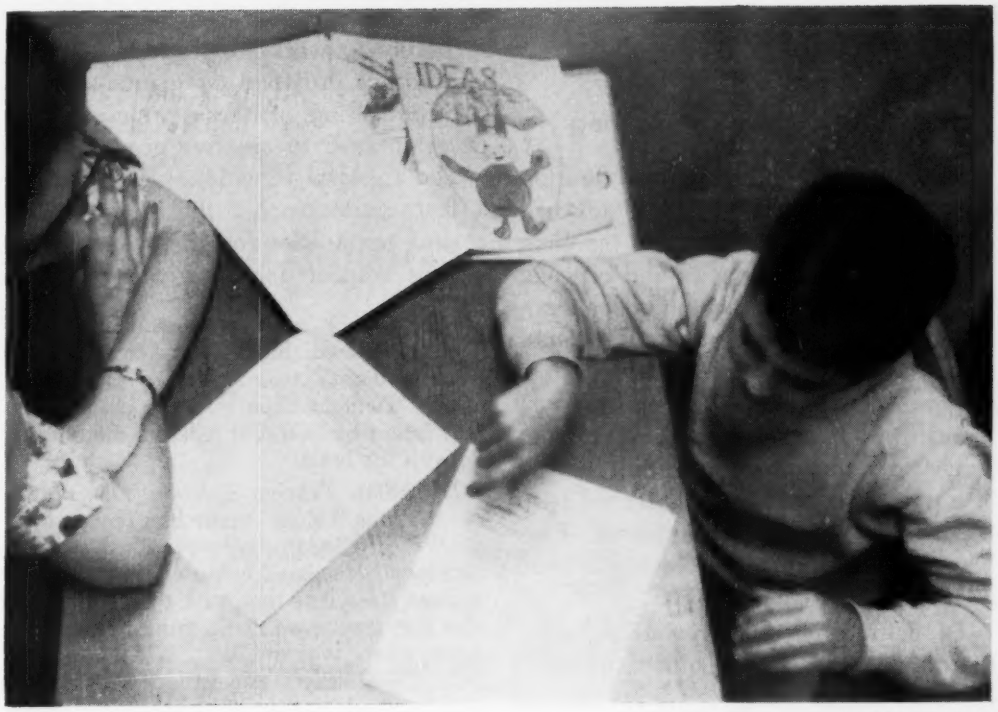
Writing the same message or story in several forms, for different audiences, for different effects, etc.

Rewriting story or other composition in a different setting, with different characters, etc.



COURTESY THE AUTHOR

The appreciative response of this first grader serves as a reward for a creative performance by his classmates.



COURTESY THE AUTHOR

Through interviews like this, attempts are being made to learn how children feel about their creative writing and that of their peers. Fourth graders like this boy supply many clues for the decrement found in the creative thinking abilities of most fourth graders.

Originality

Practice in writing unusual titles or captions for cartoons, pictures, news items, etc.

Book reports in an original manner

Writing humorous stories, anecdotes, etc.

Sensitivity

Critical reading of comic books and suggestion of changes to make them more realistic, accurate, etc.

Practice in creative listening, thinking how the speaker really feels about what he says

Expression of ideas and feelings stimulated by music.

Elaboration

Writing original plays

Writing a book or carrying out some other sustained writing project

Pupils tell entire stories through pictures, cartoons, photographs, drawings, etc.

Curiosity

Exercises to improve ability to ask good questions

Exercises to improve ability to make guesses from limited clues.

General

Encouragement of "idea-trap" habit for creative writings

Keeping folders of creative writings

Practice exercises or periods which "don't count" on grades, etc.

"Writer's Corner," a quiet retreat where pupils can go to think and to work out ideas.

Data analysis has not been completed. Results thus far, however, indicate that teachers using the manual applied a larger number of the activities included in the check-list than the control teachers and that their pupils made greater gains in the quality of their creative

writing as measured by the pre- and post-tests.

Rewarding Creative Thinking

Children and adults learn and develop along whatever lines they find rewarding. We reward children for spelling words correctly, dotting *i's* and crossing *t's*, and for being neat, polite, clean, cooperative, honest, and punctual. In other words, we reward those who meet "behavioral norms." In a recent study I found that about 60 percent of the language arts objectives for the activities of a particular day were concerned with conformity to behavioral norms. Less than nine percent of the objectives were related to creative thinking.

To help teachers in rewarding creative thinking a manual entitled *Rewarding Creative Thinking* was developed by the author and his colleagues. A set of six principles were also developed and used in an in-service training program in a field experiment. Briefly stated, these principles are:

1. Treat questions with respect.
2. Treat imaginative, unusual ideas with respect.
3. Show pupils that their ideas have value.
4. Give opportunities for practice or experimentation without evaluation.
5. Encourage and evaluate self-initiated learning.
6. Tie in evaluations with causes and consequences.

Manual users were asked to describe and evaluate specific attempts of their own in applying these principles.

These data have helped us to understand the difficulties most teachers experience in rewarding creative thinking and what happens in successful attempts. It is already clear that many teachers find it quite difficult to apply these principles. Many teachers, however, respond favorably to workshop experiences and suggestions provided by manuals. Skillful application of these principles appears to lead to creative growth.

The following incident described by a first grade teacher illustrates a successful application of the principle of having respect for imaginative ideas:

Occasion: I was introducing a poem, "February Twilight," and asked the class what "twilight" meant. One boy said that it meant "Twilight Zone." When asked what that meant he said that it had something to do with the brain.

Immediate Teacher Reaction: I asked him how "Twilight Zone" made him feel, and he answered, "Kinda funny—like it's different," and then he seemed confused as to how to express himself. I then said that I liked his idea and maybe we could think better if we knew what "twilight" was. When everyone seemed puzzled, I suggested it was a time of day. Several then suggested "not really light," "almost night," "when the sun is going down," etc.

Immediate Class Reaction: Intense interest and desire to contribute their ideas.

Way Respect Shown: I was very interested in his ideas and encouraged others to add to them.

Effects: Lee told us that he knew it was like imagination. The discussion led to that time between night and day—wakefulness and sleep—daydreaming—real and unreal. It sparked their imagination.

Three experimental approaches have been outlined for developing creative thinking abilities through language arts:

1. Helping youngsters recognize the value of their ideas
2. Providing activities which give practice or exercise in creative thinking
3. Rewarding creative thinking in the classroom.

Although evaluation of these three approaches is incomplete, all appear promising.

Margaret S. Woods

Learning Through Creative Dramatics

". . . spontaneous activity full of adventure and discovery."

I have learned that the head does not hear anything until the heart has listened, and that what the heart knows today the head will understand tomorrow.[1]

REALIZATION of maximum individual potential *is* possible through one of the most natural but neglected avenues of learning. Through individual, group and small group experiences in creative dramatics, described by Dienesch [2] as improvised activity in which the child creates his own forms, full self-realization develops as the child becomes involved in thinking, feeling and experiencing.

Quality human experiences should be carefully planned by a teacher proficient in knowledge of growth and development of the individual and skilled in techniques of dramatic art. Such experiences help the child develop awareness of purposeful living and promote self-initiated activity. They also enable the child to manage the events which occur within his culture and result in his ever-increasing movement toward balanced intellectual, physical, social, emotional and spiritual growth.

In all types of creative drama there are opportunities to experience a variety of situations and roles. Such opportunity provides constructive channeling of emotions, promotes acquisition and retention of knowledge, develops appreciation of the wonders and beauty of the world, and helps the child relate himself to the world about him through a form uniquely his. Dienesch [3] believes that, whether the dramatic creation be spontaneous or elaborate, elementary or complex, it is by making a work of art, in his own way and according to his own capacity that the child or adolescent develops most fully and harmoniously.

One aspect of creative drama included in make-believe of the child, is dramatic play which is spontaneous activity full of adventure and discovery.[4] No suggestions are needed, for "trying on life" and playing out thoughts and feelings, for dramatic play are the child's means of enjoying, exploring, testing, releas-

[1] James Stephens. *The Crock of Gold.* New York: The Macmillan Company, 1960.

[2] Marie Dienesch. "Creative and Formal Dramatics." *World Theatre.* Vol. II, No. 3, 1951. p. 30.

[3] *Ibid.*

[4] Winifred Ward. *Playmaking with Children.* New York: Appleton-Century-Crofts, Inc., 1957. p. 10.

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ing, remembering, working. The pilot flying the jet, the puppy playing with the ball, or Mother washing dishes, exists as the creation of the moment which Slade [5] indicates is the joy of dramatic play.

The oldest form of dramatic expression is pantomine, a means of communication which knows no national barriers. Through large muscle activity, rhythmically expressed through the elephant swinging his trunk, the stealthy approach of the men, swinging aboard the ship during the Boston Tea Party, the delicate rhythmic movement involved in signing the Declaration of Independence, the exacting stitches taken with care in making the first flag, all communicate thought and feeling through movement, which Siks [6] indicates is basic in the art of drama.

When a group of children make a story come alive by playing it spontaneously, whether it is original or taken from literature, history or current happening, they are having an experience in story dramatization, which differs from dramatic play because of plot.[7] Although considered by some as "drama for drama's sake," creative dramatics can be integrated with subject matter without losing the art quality since, according to Lee and Lee,[8] stories related to topics being dealt with in other subject areas can be utilized. Here the values of creative dramatics can be achieved while deeper understandings in other learnings are also being developed.

[5] Peter Slade. *Child Drama.* London: University of London Press, Ltd., 1954. p. 45.

[6] Geraldine Brain Siks. *Creative Dramatics: An Art for Children.* New York: Harper and Brothers, 1958. p. 105.

[7] Ward, *op. cit.*, p. 10.

[8] J. Murray Lee and Dorris May Lee. *The Child and His Curriculum.* New York: Appleton-Century-Crofts, Inc., 1960. p. 522.

Personal Involvement

Learning experiences built around personal involvement through creative drama, can enhance acquisition and retention of new facts and stimulate desire to do research. A display of china plates designed by the children decorated the chalk-lined shelves on the blackboard in one third grade classroom. As a result of experiencing sensitivity to the beauty of china during the dramatization of "The Little Blue Dishes," children displayed the sets with great pride to teachers and children in the school. Price lists indicating cost per piece, per place setting, settings of four, six, eight and even twelve enabled children to practice the multiplication table as children placed orders.

Probably a longing to give one's best, and to succeed, effectively communicated by one demonstrating teacher, inspired at least one child to do research and to learn to read. David knew he would have to repeat the fifth grade because he had not been interested in or able to read. However, he had a keen desire to be Tom Sawyer in the playing of the whitewashing scene from the *Adventures of Tom Sawyer.* Because he insisted, "I've *always* wanted to be Tom," the teacher finally chose David rather than another highly capable boy in the group. Throughout the play, Tom had difficulty making decisions, but he made them with all the courage he could summon.

Following the play an evaluation was made, "What did you like best about the play?" Many positive comments resulted with suggestions for improvement. Hur-

rying up to the teacher as the other boys and girls were leaving, David, eyes sparkling, asked, "How did I do?"

"How do you think you did, David?"

"Well, you know, if I had a chance to do it again, I could do it a lot better."

"You know, David, I too did something for the first time this morning and when I repeat it, I'll do it a lot better. But tell me, what will you do to improve your playing?" The teacher then discussed with David the strong points and possibilities for improvement on a subsequent occasion.

The following day, David's mother revealed the boy's sudden renewed interest in reading. "Mom, could we stop and buy the book of Tom Sawyer? You know, I never have read that book all the way through. I want to see if Tom could reach the top board as easy as I could."

Through continued effort in providing opportunities for story dramatization, David was able to assume roles which helped him to build courage and confidence, a desire to do research and to understand words. Like others, David felt the satisfaction that comes when one struggles with a new idea, taking out the truth, sticking to it, being responsible for his own actions and successfully solving a problem. Empathy with human experiences of the ages, truths inherent in great works of literature, art, music, develop understanding, as Anderson [9] indicates:

> A child's first act of creativity is to get in relation symbolically to something or somebody outside himself. This will appear as language as soon as play, for in play the child begins the never-ending struggle to understand both his world and the world as conceived by others.

[9] Harold H. Anderson, editor. *Creativity and Its Cultivation.* New York: Harper and Brothers, 1959. p. 185.

It is not always necessary to dramatize a story. Through pantomimic activity, students in one Spanish class improvised situations involving specific characters of the present and past through the game, "¿Quién soy?" The spontaneity with which students responded brought forth a need for new word combinations, knowledge of verb tenses, ability to think on one's feet. Questions such as "¿Esta Vd. en los Estados Unidos? . . . ¿Esta Vd. en TV? . . . ¿Vive Vd?" placed the entire responsibility of identifying the characterization through questions asked in Spanish. As a result, discipline problems began to disappear, for the need to know was ever present.

Life Cycle

The joy of creating develops a capacity to approximate intellectual and emotional heights. As the child creates, he lives fully and richly the character which seems so real to him.

An understanding of the life cycle became most meaningful in one first grade room in an experience with maple wings. These wings snuggle under the "dirt blanket" to rest until Spring whispers, "It's time to grow." One day Susan commented, "We're going to have a new baby at our house, and I get to name it Judy or Jim." The teacher aroused the curiosity of the group with the statement, "Isn't it nice that Susan is going to have a baby brother or sister at her house? But you know, I have something here in this box, something for each one of you. It has a tiny baby inside. It isn't exactly like Susan's baby brother or sister will be, but it is a tiny baby." Asking the children to close eyes and hold out hands, the teacher deposited a maple wing with each child. She then sug-

gested that they touch, feel, think, wonder, about it. "How does yours feel to you?" she asked.

"Mine is soft as fur."

"Mine isn't, it's like Daddy's face when he doesn't shave."

"Mine feels scratchy like my rusty handlebar."

"Well, if there's a baby in there, he doesn't even wiggle."

"Sure, it has to rest first so it can be strong enough to move." Silent thoughts indicated wonder about the baby closed up tight inside.

"Could it move if it wanted to?"

"Can I break it open and take it out?"

"No, Johnny, it will come out when the time is right. What will help?"

Answers from the children included, "Sun . . . wind . . . rain . . . a good, warm, dirt house."

The teacher then suggested, "Let's all snuggle down in our own warm dirt house. When the music tells you it's growing time, let the sun help you push your way out of the little house."

Thirty-two children, closing in as small as possible, responded slowly, sensitively to "Morning" by Grieg, in complete rhythmic unfolding, exploring, pushing up and out, each with a rhythm all his own, struggling to go beyond but with an inner harmony that results from giving one's all.

Evaluation by the children included such comments as, "I felt the warm sun on me, when I pushed up through the ground."

"I got a drink from the sprinkler."

"I saw one plant that was growing faster and faster into a tree so it could grow more seeds."

"My seed got warm just like when I pop popcorn and away I went clear up through the ground."

"I popped back quick into the dirt because I heard thunder," exclaimed one startled child.

The teacher encouraged real thoughts and feelings by asking, "What do you feel like doing when you hear thunder?"

"It makes me feel like running and hiding in the closet."

"It makes me all hunched up, and I put my hands over my ears."

"You know, boys and girls, I used to be frightened by thunder until my daddy told me that it was just Station S K Y broadcasting."

A chorus of "What's that?" from the children indicated no recognition of the word, S K Y. "I'm going to let you find out. I hope you do before that station broadcasts again."

The following day, Tommy, who seemed to spend almost as much time in the principal's office as he did in his classroom, arrived early and was down on the floor with five books spread out in front of him when his teacher arrived. Since there was a rule in that room that no child could enter ahead of the teacher, he again made a visit to the principal's office.

"But I was only trying to find S K Y," he tearfully explained. "I looked in all my comic books at home but I couldn't find it, so I had to come early because it takes me so long to figure out words." The principal, with Tommy and five other first graders who had been unable to locate the station that broadcast thunder, borrowed a picture dictionary and discovered for themselves, a word which expressions on their faces indicated they should have known all the time.

A Climate for Creation

Dramatization of worthwhile material provides the child with quality human experiences and promotes capacity for

coping with problems. A desire for more of the quality feeling and a willingness to struggle for it are evident when opportunity exists to feel the difference between order and chaos, love and hate, ridicule and praise, bravery and cowardice. For example, empathy with General Washington and his men at Valley Forge may bring renewed effort in coping with failure, facing a problem, finding a means for successful solution. Such understanding may set greater forces in motion in the process of striving and becoming, ultimately equipping the child with wisdom and skill as he slowly but surely acquires responsibility for behavior.

The child discovers what life appears to be through participation in worthwhile experiences some of which exist only through participation in the art of creative dramatics. As Trevis [10] indicated, "Imagination is the faculty of forming images whereby the Soul beholdeth the Likeness of Things that be Absent." By tapping the individual's feelings through identification with things and people, one has reached a source of energy which can provide a most effective means for learning.

A climate conducive to constructive creative expression, whether it be in writing, painting, movement or dramatics, challenges the teacher. Although there is no one set of techniques, results can be achieved by acting upon suggestions of a number of educators.[11] However, it would seem that a climate which houses "enemies of creativity" is easier to identify, because remarks which place courage and confidence in the deep-freeze are clearly evident. Some such remarks include:

"It doesn't look like it to me."

"When you're older you'll understand."

"Why did you have to do that?"

"How many forgot their money again?"

"It's time for the Bluebirds to read."

"Those of you who miss more than five will have to stay in during recess."

"How did you happen to spill so much?"

"You'll have that next year—if you pass."

"Let's get back to our seats. We still have to finish the next page before the bell rings." (As the children gaze with awe and wonder at the first snowflakes of the season.)

Elimination of some of these "enemies of creativity" marks a beginning, for some teachers, of a desire to help children realize maximum potentialities by making way for constructive creative expression.

Participation in creative dramatics rewards not only the learner but the teacher as well: In reaching far below the surface for the child's best; in the struggle to provide situations which combat the stifling effects of mass culture; in removal of pressures which discourage appreciation of awareness of beauty, truth and goodness, so vital in the cultivation of taste; in the presentation of dramatic situations which build inner controls in discipline; in the joy of creating as one seeks to understand, appreciate and respect self and all mankind. Anderson [12] believes creativity as personality development is not only a product of openness in human relating; it is a further opening to higher levels of harmony in the universe.

If one would but lend an ear to those who learn through a dramatic approach to teaching, through the art of creative

(Continued on page 32)

[10] Florence Cane. *The Artist in Each of Us.* New York: Pantheon Books, Inc., 1951. p. 124.

[11] References at the close of the article.

[12] Anderson, *op. cit.*, p. 141.

Science involves analysis,
synthesis and recombination,
all of which constitute creativity.

George G. Mallinson

Creativity in Science and Mathematics

IT IS indeed a sterile and desolate task to attempt to define "creativity." The limits of human vocabulary place restrictions on the denotation of such a dynamic concept. In effect, the linguistic barriers on creativity of expression are self-defeating. Yet, from an empirical point of view, it is possible to recognize certain attributes of creativity and also to identify differences among persons in terms of their possession of these attributes.

Among the many statements concerning creativity, one by Trow [1] seems to summarize the concept better than others:

> . . . the creative process is very elusive. It can be observed only introspectively and then only in retrospect after the creative act is completed. . . . However, it may be surmised that the phenomenon is very similar to, if not identical with, that of insight. Components of experience are abstracted from their familiar pattern and recombined into a new organization. Thus, the discovery of a solution to a problem is a creative act even though the outcome is not a work of art.

[1] William Clark Trow. *Educational Psychology*. Second Edition. Boston: Houghton Mifflin Company, 1950. p. 655.

Such a view of the creative process is consistent with the dynamic nature of science. In 1951 Conant [2] emphasized the dynamic nature of science [3] by classifying it as an activity, rather than an accumulation of knowledge. He stated that "science is an interconnected series of concepts and conceptual schemes that have developed as a result of experimentation and observations." Such a view of the scientific activity broadens the realm of scientific knowledge, rather than provides rapid transit to the end of the trail. The visible spectrum of concepts, ideas and new problems in science is thus increasing geometrically in magnitude.

Need for Creative Minds

Any discipline, in order to flourish, must acquire personnel with the desired functional attributes. The discipline must also provide a climate in which these attributes can be nurtured. In science,

[2] James B. Conant. *Science and Common Sense*. New Haven: Yale University Press, 1951.

[3] In this paper, the term "science" is construed to refer to the fields of both science and mathematics.

therefore, the personnel and the climate must manifest creativity. Many persons, however, find it possible to believe, without basis in fact, that creativity is not a general endowment for all mortals. Thus, during the educative process, the direct concern for creativity is often neglected. The respect for the creativity of the genius, and the deference now being paid to the "talented," unconsciously induce the belief that creativity is a special attribute that the average person lacks. Also, it seems to be accepted that the able person must become a disciple of "Joe Science" in his educational and occupational allegiances. Such views are not scientific. Without doubt, as is true with all attributes, every person possesses creativity to some degree.[4]

Indeed among scientists and those who deal with the products of science, the need for creative expression in scientific behavior is evident at all levels. Oppenheimer[5] made this point most cogently in his speech at Roosevelt University. He stated:

Among the founders of the United States it is natural for us to remember Franklin and Jefferson; they were both in some real sense men of science as well as statesmen. They looked to science as an essential part of this country's heritage. They saw first that in practical terms it was a strong tool against misery and poverty and squalor. They rightly understood that science would contribute to the well-being and the civility of life in America. They saw it in intellectual terms as a guard against ignorance and superstition. They saw it in political terms as a guard against tyranny, barbarism, repression, and bigotry, that they associated with centuries past, with the religious wars, the inquisition, and what they thought of as the dark ages. For them it was incompatible only with an authoritarianism, by which, they were determined, this country should never be darkened.

The need for creativity in scientific behavior is recognized at all hierarchies of the cultural complex. The aristocracy of science has long since given way to the recognition that science is an activity that pervades all dimensions of man's pursuits. Lehner[6] for example sounded the death knell of the purchase of the "bent back" when he made the following assertion:

The day of common labor is coming to a close, but there is no cause for regret. To meet the requirements of improved technology, the common laborer is becoming skilled, and the skilled worker is becoming a technician. This is upgrading rather than retrogression, and the increasing use of minds rather than muscles has been reflected in the sharp climb of wages and salaries. We are all better off.

For those at the professional end of the spectrum of scientific endeavor, the criterion of creative effort has also been emphasized. Dean Burchard[7] of Massachusetts Institute of Technology decried the scientists and engineers who pursue their professions as exercises in science and mathematics rather than view themselves as shapers of their environment. He pleaded for the crea-

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[4] Kimball Young. *Personality and Problems of Adjustment.* Second Edition. New York: Appleton-Century-Crofts, Inc., 1952. p. 185.

[5] J. Robert Oppenheimer. *Science and Our Times.* Roosevelt University Occasional Papers: No. 2. An address at the Annual Dinner of the Association of Founders and Friends of Roosevelt University, Conrad Hilton Hotel, Chicago, Illinois, May 22, 1956.

[6] Samuel Lehner. "A New Horizon for Scientific Education." A paper presented at the Convention of the National Science Teachers Association, in Washington, D. C., March 16, 1956.

[7] *Creative Leadership.* The Cooper Union for the Advancement of Science and Art. The President's Report to the Trustees for the Ninety-Eighth Year Ending June 30, 1957. The Cooper Union, Union Square, New York 3, N. Y. p. 11.

tive engineer who can recognize the social principle in his efforts at scientific leadership.

It would seem redundant, therefore, to discuss further the need for creative minds at all levels of scientific behavior.

Aim of Creative Science

There occasionally arises the idea that anything of practical and useful value is beneath the dignity of a gentleman and scholar. Whether such an idea is a cause, or a symptom, nevertheless it is part and parcel of the dichotomy of pure versus applied science, pure versus applied mathematics, and science versus technology and engineering. Perhaps the best illustration was expressed many years ago by Hilbert, one of the greatest and "purest" of mathematicians. He is alleged to have said, "One hears a good deal nowadays about the hostility between science and technology. But that is not true, ladies and gentlemen. That is not true at all. How could it be true? They have nothing whatsoever to do with each other." [8] Such views are not consistent with the role of creative science as it is viewed today. Science and technology are symbiotic because technology would be crippled without the knowledge sought for other reasons.[9] Also, technology provides science with new instruments and new techniques. There is a constant and reciprocal feedback between the two that demands creative efforts in both. This point was supported by Mortimer Adler, Director of the Institute for Philosophical Research, who indicated that creativity involves more than originality and novelty. If creativity is to be intrinsically good, it must be productive of things of lasting value.[10]

Indisputably, then, creativity is an aim of all science and all mathematics at all levels and in all dimensions. The aim must pervade both teaching and learning and be sought, elusive as it may be.

Fostering Creativity Through Science

As stated by Bertrand Russell, in *The Impact of Science on Society,* science has two functions, namely, to teach people *to know* things and to teach people *to do* things. The latter point envisions the creativity under discussion. How best can it be fostered?

Dean Keppel of the Graduate School of Education at Harvard University has indicated that three approaches may be used to foster creativity. One way is to let "nature take its course" with the view that creativity is a facet of learning that is fostered without cultivation. The second approach is to provide an atmosphere conducive to creativity without an effort to analyze its dimensions, and the third is to provide learning situations that give students the opportunity to ask questions, analyze situations and solve problems.

The weight of the research evidence completely discredits the efficacy of the first approach and eminently supports the desirability of a combination of the second and third. In his summary of research investigations concerning the attainment of objectives of science teaching, Mallinson concluded that recent evidence completely supported what was already conclusive, namely, learning objectives

[8] J. Robert Oppenheimer. "The Need for New Knowledge." *Symposium on Basic Research.* Publication No. 56. Washington, D.C.: American Association for the Advancement of Science, 1959. p. 9.

[9] *Ibid.*

[10] *Creative Leadership, op. cit.,* p. 13.

are attained maximally through direct effort.[11]

Obviously, the overt manifestation of creativity is a matrix that cannot be taught *in toto*. It would seem reasonable, therefore, that in science, a careful scrutiny should be made of the intellectual dimensions of scientific *performance*. At present such dimensions are neither clearly recognized nor understood.

This point may be illustrated by comparing science with other disciplines. For example, when teachers are asked to list the desirable outcomes of language arts, they name, among others, the dimensions of "to read," "to write," and "to spell." If asked the same question for science, too often there emerges, "know something about rocks," or "birds." Or, under pressure, they may list the outcomes as being able "to think critically," or "to use elements of scientific method." The first are not objectives at all, but merely the tools; the latter are but nebulous platitudes. The solution does not come either from the true pedagogue who might suggest, "think critically about birds."

The important step is to define in words of one syllable, and which all can understand, the dimensions, not the matrix of scientific performance. This means the development of a series of simple statements identifying what an individual is expected to *do* better as a result of his studies in science. This must be followed by a conscious and directed effort to provide situations in which the "doings" can be practiced. The ecology of the frog cannot be learned by memorizing his "innards," nor the flow of electricity understood by memorizing $E = \frac{I}{R}$. The creative mind in science is developed not by memorizing the output of other creative minds, but by participating in the creative act. These opportunities for participation must be provided for all, without regard for their extent of use of science.

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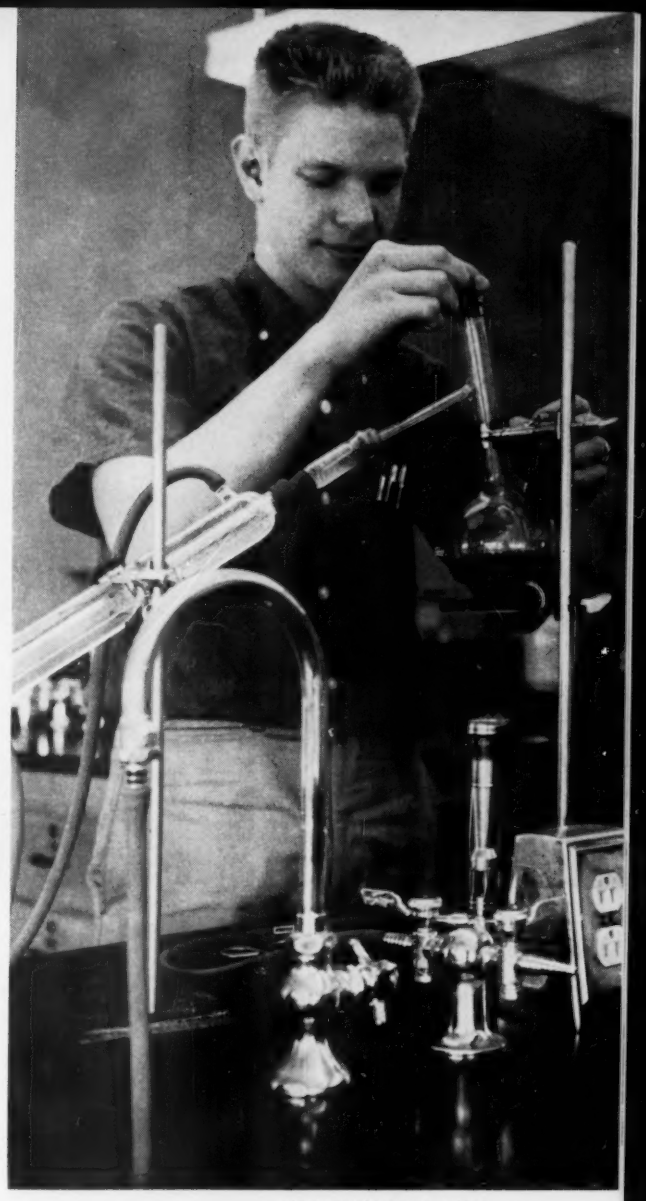

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Learning objectives are best attained through direct effort.

[11] George Greisen Mallinson and Jacqueline V. Buck. "Some Implications and Practical Applications of Recent Research in the Teaching of Science at the Secondary-School Level." *Science Education* 38:58-81, February 1954.

COURTESY NEA, CARL PURCELL

Manfred L. Keiler

Creativity: Core of Art Education

IN THE education of young people, few aspects have been given more attention in recent years than the understanding and furtherance of creativity. This newly heightened interest in one of man's most significant faculties is good, and long overdue. The primary reason for it can probably be found in the spirit of our time. Seldom during the course of history has the need been so acute for solutions to new or apparently solved problems—be they technological, social or psychological.

The discovery of solutions to problems is essentially a creative act—a process of becoming aware of hitherto unnoticed

Inspiration
and hard work
are wellsprings of art.

and unexpressed relationships, or of bringing order into a conglomeration of seemingly unrelated facts. This gives rise to the question: is there any difference between creativity and inventiveness? In principle, the major difference is one of semantics. Commonly, the word "inventiveness" designates a mental activity which leads to the unfolding of new thoughts or to the origination of predominantly useful objects; "creativity" is used mostly in connection with performances of the mind which result in concepts or works without immediate utilitarian value but with pronounced aesthetic or intellectual merit. In brief, the terms "creativity" and "inventiveness" define essentially the same activity, but differ in relation to the results of this activity.

Creativity is one quality which distinctly sets man apart from all other creatures on earth—through it he is able to achieve unrealized ideals, seize hidden visions, imagine new ideas, and envision unknown aspects of reality. Creativity is an active force, an energy, and its antonyms are passivity and conformity. Creativity is not merely a synonym for the production of works with artistic merit—it has much more far-reaching implications: it is the name given to the process of emerging ideas which entails apprehending new possibilities, sensing unprecedented solutions, and conceiving unique concepts.

By accepting creativity from this broad point of view, the scope of art education immediately takes on much larger dimensions than is commonly realized. The motivation of young people combined with the means and instructions for visual creations of aesthetic merit and a personal, expressive and skillful quality, is only *one* aspect of the total aim of art education. Fundamentally its major concern is to awaken, foster, and stimulate in students that which only too often remains unchallenged in the course of an average school day: their innate creative ability.

Multiple Solutions

If one studies the offerings of our high school curricula, one finds many subject areas dealing with innumerable facts which frequently convey the idea that educated man lives in a world of absolute certainties. Actually, most youngsters are given the impression that learning equals the accumulation of indisputable truth, and that the adult world which they will soon enter is filled with the same certainties as are most of their classroom hours. Mathematical theorems, laws of physics, chemical formulas, historical data, and grammatical rules are presented to students in terms of absolutes which leave no room for doubts or uncertainties. Their days consist largely of memorizing these indisputable facts, and the only uncertainty they encounter is due either to poor memorization of these facts, or to an inability to relate them intelligently to a different or varied context. But here again, the students' teachers will tell them with certainty what is right or wrong, and

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A large part of this article was taken from the author's forthcoming book, *The Art in Teaching Art*, to be published soon by the University of Nebraska Press.

whether or not they have performed well. In this form of learning students are rarely confronted by problems which have more than a single solution.

In principle, problems which permit multiple solutions are often confusing to students, because a strong element of uncertainty is entailed. "Psychologists explain the search for certainty as the desire to return to the early days of infancy, which were not troubled by doubt and were guided by the confidence in parental wisdom."[1] The adolescent frequently transfers some of his confidence in parental wisdom to his teachers. He expects the teacher to *know*, and "to know" means, to the student, to provide him with certainties. However, this form of education does not correspond to many aspects of real life, where man is almost constantly bombarded by uncertainties. It is in this very respect that the art area simulates reality most closely.

As reality, the creative activity is also filled with uncertainties because any creative undertaking consists of many steps into the unpredictable and the precarious. Every creative thought leaves the known premise and ventures into something new, unknown and therefore uncertain. To become accustomed to living and working without certainties is as much a prerequisite to any success as knowing many precise facts. During art sessions students learn to realize that many significant areas of human endeavor are without absolutes and without certainty, and that courage, vision and the ability to pursue an aim steadfastly are equally as important to achievement as skill, techniques and facts. Learning to work with uncertainties and not to be frightened by them is one significant contribution which the art area can provide.

[1] Hans Reichenbach. *The Rise of Scientific Philosophy*. Berkeley: University of California Press, 1957. p. 36.

Solving Problems

One other unique contribution which the creative activity can make to the education of adolescents is helping them learn to solve problems. Exercises in this form of discipline are a part of almost all academic subjects. The most obvious subjects which provide rich opportunities for problem solving are mathematics and the sciences. However, in these areas known laws and facts generally permit only a single, predetermined solution to a given problem. This is in many respects quite different from the creative area where no absolute rights and wrongs exist, and where the problem is largely self-imposed by the student and allows a variety of solutions. In addition, creative and artistic problems cannot be solved by applying clearly formulated and inflexible laws or objective facts.

The essential problem in creative expression is based on the desire to state convincingly an observation and/or emotional reaction to an experience, and to find a corresponding, clear and meaningful formulation. Finding the most adequate expression constitutes a problem for which each artist, or student, has to discover a new solution every time; he will not be able to express creatively the identical situation twice in an identical manner. Therefore, no existing former solution can ever be reapplied in exactly the same way.

Solving self-imposed problems which are an essential part of the creative process requires a large degree of self-

discipline. The value of self-discipline is so evident that no further deliberation appears necessary. However, in this context, a more detailed analysis of the relationship between the creative process and self-discipline seems justifiable.

Spontaneity

When one studies average art works by high school students, one can detect many failures which can be directly attributed either to the students' inability to attend to detail, or to their inability to carry out projects to their final and most satisfactory conclusion. After all, every genuine work of art contains two basic elements; one is plain labor, and the other is a composite of inspiration and invention.

In many instances these elements become quite obvious in significant works of art after only a brief study. Yet it is not infrequent for great masterpieces to give us the impression of having resulted from a spontaneous creative outburst. However, these "unlabored" creations are often deceptive; they are, in fact, highly skillful disguises hiding strenuous efforts, or else they are the results of years of arduous exertion. Whistler claimed that "to say of a picture, as is often said in its praise, that it shows great and earnest labor, is to say that it is incomplete and unfit for view. . . . The work of the master reeks not of the sweat of the brow—suggests no effort—and is finished from its beginning." [2]

It is not rare to find untutored spontaneity in the drawings of small children, and we rightly admire them for it. But a marked difference exists between the work of elementary school children and that of high school students. It is characteristic that adolescents, with their self-critical attitude, lose this desirable effortlessness. The high school student, like any artist, must therefore labor to the limit of his ability and must then attempt to go beyond this point.

The importance of self-discipline and hard work in relation to creative efforts is often insufficiently well understood. "We of today have little realization of the amount of labor expended on the long road from apprenticeship to mastery, whereon the world's artists have all had to travel in the past. The popular notion of genius, surviving probably from the Romantic movement, as an effortless and God-given illumination, descending like the Pentecostal dove on the chosen few, has corrupted our understanding of the artist's real nature and encouraged all manner of outrage, ranging from laziness to sheer impudence, in the self-chosen apostle of today, who has indeed a gift of tongue, but no other manifestation of divinity. Until recently, art has been very hard work. It is still so for those who preserve any continuity with the Great Tradition." [3]

It is mainly self-discipline which enables the artist to travel the difficult and laborious road leading from the creative impulse and the spontaneous sketch to the finished work. Considerable self-discipline is needed to be swayed neither by a lack of immediate success, nor by disappointment due to a feeling of inadequacy. In fact, one of the most important prerequisites for any creative success is the ability to pursue an aim steadfastly, regardless of whether or not rapid results are attained. This ability

[2] James McNeil Whistler. *The Gentle Art of Making Enemies.* New York: G. P. Putnam's Sons, 1923. p. 115.

[3] Rhys Carpenter. *The Bases of Artistic Creation.* New Brunswick: Rutgers University Press, 1942. p. 35.

is effective in most working situations and is definitely not restricted solely to the art area.

Some peripheral conditions and elements of creativity are known. We know that self-discipline and concentrated effort as well as imagination and experience are particulars which are constituents of creativity. Yet creativity as such, in spite of many attempts at investigating its basic components, is still as much a mystery as life itself. Carl Jung wrote: "The creative aspect of life which finds its clearest expression in art baffles all attempts at rational formulation. Any reaction to stimulus may be causally explained; but the creative act, which is the absolute antithesis of mere reaction, will forever elude the human understanding. It can only be described in its manifestations; it can be obscurely sensed, but never wholly grasped."[4]

[4] Carl Gustav Jung. "Psychology and Literature." *The Creative Process.* Brewester Ghiselin, Editor. Berkeley: The University of California Press, 1952. p. 209.

Creative Dramatics

(Continued from page 23)

dramatics, one might hear in response to the question, "Why was it fun?" such comments as these:

"Because I got to be President." (A fourth grade boy who, as General Washington, inspected the flag.)

"Because you can do the best you know how to do and nobody grumbles." (An eighth grade boy who had just appeared in the front of the room for the first time in six months.)

"Because I have a whole bucketful of new words." (A fifth grade girl who enjoyed contributing "picture words" for descriptions of characters in Rachel Field's poem, "Roads.")

"Because when you use your imagination, everything comes out all right." (A fifth grade boy who had become a pilot making a daring rescue on Mt. McKinley.)

"Because you seem to understand our needs." (A shy fifth grade girl who felt awe in sighting the tower in "Why the Chimes Rang.")

"Because you can be mean and not hurt anybody." (A fourth grade boy who enjoyed playing the role of the giant in "Jack and the Beanstalk," but realized that the giant does not gain the respect of the players.)

"I've learned enough to last me for three days." (An eighteen year old student about to receive a certificate of attendance from a special school for slow learners.)

Through the art of creative dramatics, dreams and ambitions, attitudes and values, inner controls, aesthetic appreciation, sensitivity of spirit and a song in one's heart daily fill the learner's storehouse. Through identification with quality human experiences which help build rather than destroy, courage and confidence to go beyond that which is expected, wisdom and ability to respond effectively to change, develop on a high level through a dramatic process of thinking, feeling, experiencing, a process which affords the learner opportunity to achieve full self-realization in the world of tomorrow.

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"There is the same sort of advantage in having conceptual frameworks manufactured and on hand in advance of actual occasions for their use, as there is in having tools ready instead of improvising them when need arises."—John Dewey

Nathaniel Champlin

John Dewey: Beyond the Centennial

I

THE most comprehensive value criterion Dewey would have us build into our conceptual framework as teachers still stands as a dynamic challenge to education: "The educational process has no end beyond itself; it is its own end. . . . Since in reality there is nothing to which growth is relative save more growth, there is nothing to which education is subordinate save more education." [1] This value criterion "must find universal and not specialized limited application." [2] The full range of experiences and problems available must be confronted if growth in one direction is seen in its relation to "continuing growth in new directions."

But those of us who are concerned to fashion a curriculum must have more to go on if we are to determine the *kinds* of experiences or problems to include and the kinds not to include under the "growth for the sake of further growth" criterion. What Dewey calls "intermediary propositions" are needed in order that the proposed "universal" criterion effectively guides the selection and rejection of curriculum—even report card —content. And if we undertake such research, then we must focus upon the theory of thought, intelligence and learning upon which the growth criterion was built and to which it must finally submit. But here, too, Dewey leaves work to be done.

In discussing thought and one kind of its workings he tells us that he has "touched only upon the fringes of a complex subject" and that he will be satisfied if he has directed our attention to "neglected" aspects of the problem of thought. Dewey's conclusions on these two interrelated matters suggest that we can proceed more adequately not simply by mastering and applying, but also by reconstructing and extending his own theories. The task is no less than that of sharpening our most important "tool"—our conceptual framework.

[1] John Dewey. *Democracy and Education.* New York: The Macmillan Company, 1916. p. 59-60.

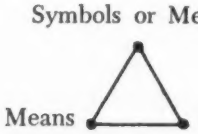
[2] John Dewey. *Experience and Education.* New York: The Macmillan Company, 1938. p. 29. By permission of Kappa Delta Pi, Tiffin, Ohio, owners of copyright.

II

For Dewey intelligence is a procedure, activity or function rather than some *thing* located *inside* some other thing. It is a behavior which is directed by purposes, ends or goals. "Ends are foreseen consequences . . . which are employed to give activity added meaning and to direct its further course." As such, ends are not "terminal points of activity" but rather "redirecting pivots in action." [3] And they are ends only when fashioned in terms of the means to their achievement.

To have purpose—anticipation or expectation—fashioned in *terms* of the means to its achievement is to have symbols. The process or activity of ordering means to ends is symbolic—a case where a future, a non-present, is represented in the present. "A being which can use given and finished facts as signs of things to come; which can take given things as evidences of absent things, can, in that degree, forecast the future; it can form reasonable expectations. It is capable of achieving ideas: it is possessed of intelligence." [4]

These notions can be illustrated as follows:



Past . . . . . Present . . . . . Future

In developing his conception of symbols and their interrelations Dewey notes quite often his indebtedness to Peirce. According to this view there are three requirements to be met in order that a symbol be present. First, there must be something which represents; second, there must be something which is represented; and third, there must be something which makes the connection between the two. In the words of Peirce, "A *Sign* or Representamen, is a First which stands in such genuine triadic relation to a Second, called its *Object*, as to be capable of determining a Third, called its *Interpretant* . . ." [5]

The names constituting a teacher's *class list* might be taken as "Signs," the students in the classroom may be taken as the "Referents" for the "Signs," and a *seating chart* (or a show of hands at an initial roster call) may be taken as that which links up the two—the "Interpretant." Anything, of course, may be defined, interpreted, to stand for anything else. It is important to note, however, that a symbol is not to be construed as *identical* with its object. But it is more important to note, after Peirce and Dewey, that all three points of our triad must be available in experience; they must be common, sharable or experiencable. Only then can anticipation or expectation be formulated in terms of means and take on the character of being predictions.

For Dewey symbols may represent "anything under the sun." But he differ-

[3] John Dewey. *Human Nature and Conduct.* New York: Henry Holt and Company, 1922. p. 225-34.

[4] John Dewey. "The Need for a Recovery of Philosophy." *Creative Intelligence.* New York: Henry Holt and Company, 1917. p. 21.

[5] C. Hartshorne and P. Weiss, eds. *The Collected Papers of Charles Sanders Peirce.* Cambridge, Mass.: The Belknap Press of Harvard University Press, Vol. II (copyright 1931, 1932, 1939, 1960 by The President and Fellows of Harvard College). p. 274.

entiates between symbols or conceptions on the one hand and "existential matters" on the other. *Symbols may represent symbols or they may represent non-symbols.* The terms "laws of logic" represent "abstractions" or symbols in the form of rules while the term "apple" represents something other than, but in another situation capable of becoming, a symbol.

> Operations, to anticipate, fall into two general types. There are operations that are performed upon and with existential material. . . . There are operations performed with and upon symbols. But even in the latter case, "operation" is to be taken in as literal a sense as possible.[6]

Here Dewey is rejecting two historical traditions: First, there is that tradition which exhausts intelligence in knowledge and deductions therefrom; and, second, there is that tradition which depreciates ideas or theory save where those ideas or that theory lead directly to "practice," which, in its turn, is conceived as something other than practice with and upon ideas. The former arbitrarily limits intelligence to knowledge while the latter dangerously approaches "anti-intellectualism." What Dewey is holding is that there are means, ends and methods which *are* symbolic, ideational or theoretical; but also there are means and ends which *are not* symbolic, ideational or theoretical, but which are serviced by method which *is* symbolic, ideational or theoretical.

Intelligence, then, is not the exclusive property of those who work focally with "signs and number." The full act of intelligence also may include things, materials and tools. It is evidenced not only as the mathematician or philosopher manipulates theory to gain theory, but also as the carpenter, fisherman, housewife or automobile mechanic goes about ordering means to ends characteristic of his or her respective experiences. At the point of method, however, symbols are generic to all instances.

According to this Deweyan account of intelligence, a creative education would be organized around problem situations. Without an end-in-view there would be no problem. Without a problem there would be no learning. *Method* would receive primary emphasis with full recognition of the fact that it always entails ends and means and cannot operate in a vacuum. And since the conception of symbol, located at the heart of method, has been fashioned in light of "that experimental method by which all the successful sciences . . . have reached the degree of certainty that are severally proper to them today," [7] the method of intelligence is one with the method of empirical inquiry. Critical and creative thinking is one with the procedures of scientific thinking. Thus the "growth for the sake of further growth" criterion comes to include the method of science —or the method of critical thinking— as one, if not the, major principle of selection.

III

Dewey made much of the point that a symbol in isolation has no meaning, that reasoning as a process of "develop-

(Continued on page 38)

[6] John Dewey. *Logic: The Theory of Inquiry.* New York: Henry Holt and Company, 1939. p. 15.

[7] C. Hartshorne and P. Weiss, eds. *The Collected Papers of Charles Sanders Peirce, op. cit.,* Vol. V, 1934, 1935, p. 465.

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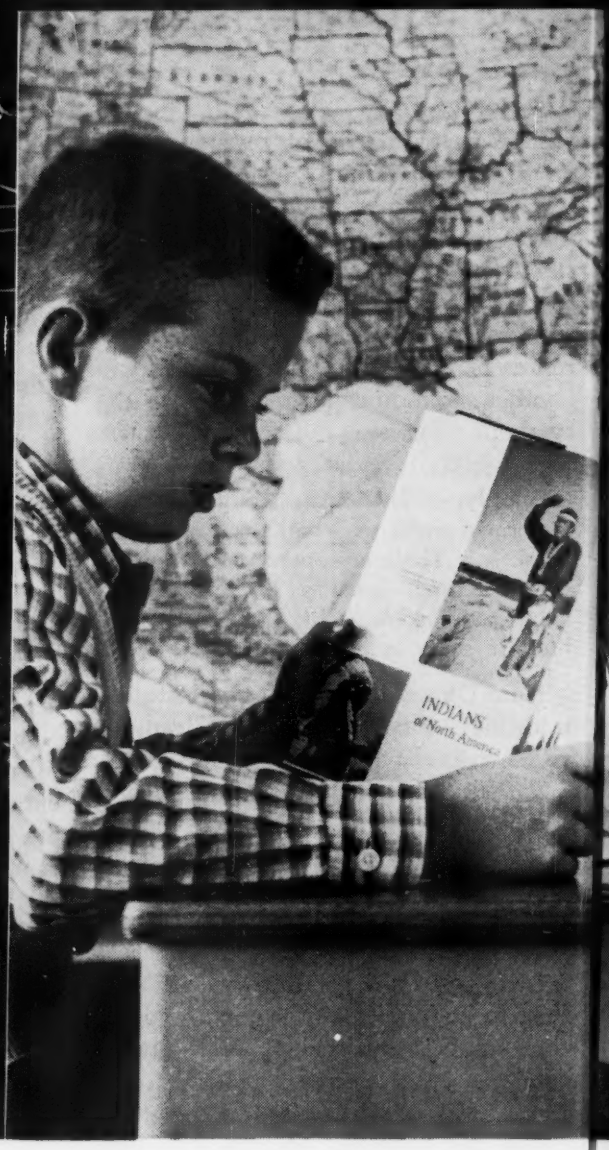

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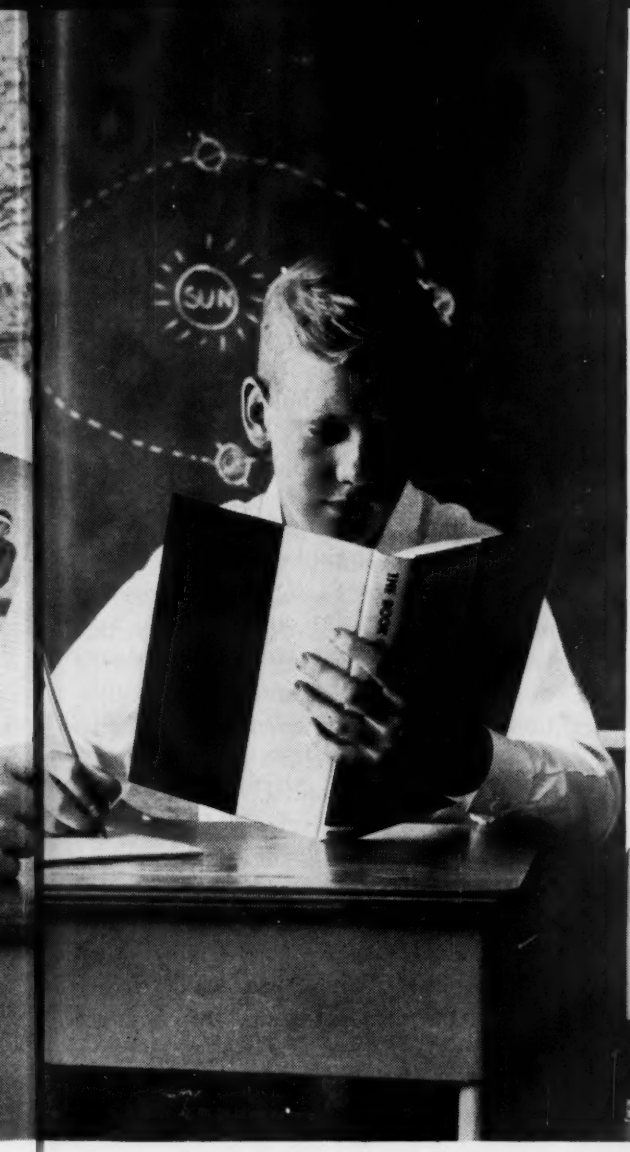

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(Continued from page 35)

ing the meaning-content" of ideas "necessitates the noting of relations of symbols to one another the formulated relation constituting a proposition." To accept a proposition is to commit oneself to "such and such other relations of meanings because of their membership in the same system." [8] Such a system he would label a "universe of discourse." And although Dewey left it to others to spell this out we may note with him that the terms *physiology, biology, psychology, chemistry* and *sociology* may be taken to represent distinguishably different "universes of discourse" and have become categories by means of which we structure curriculums.

But the point to be made for educational theory is that these terms are differentiations of theoretical or symbolic means, ends and methods. That is to say, there are ends, means and methods which are theoretical or conceptual and which may be labelled *psychological* or *biological.* A psychological end, or *problem* is a theoretical end or problem generally and an end or problem made up of psychological theory particularly. The means or "needs" of psychology are symbols or propositions; and the method of psychology is broadly that of the method of science. To say that someone has psychological or, for that matter, biological problems, needs or "wants" is to say either that someone is a psychologist or biologist or requires knowledge provided by these disciplines. To say that the infant is born with biological needs is to say that the infant is born a biologist or requires for some other purpose knowledge provided by the science of biology.

The above is not intended to be whimsical. It should be taken as technical and important for a Deweyan based theory of learning and problem solving. First, the rather popular practice of assuming that the individual, child or adult, is partitioned in the same manner in which we can catalogue the various sciences cannot be supported either by a single science or by a collection of several sciences. The same holds true with respect to the three Rs. Only books, libraries, curriculums and conceptualizing can be so partitioned. Second, to use the term *psychological, biological* or *physiological* to qualify something other than knowledge, knowledge gaining, or objects *located* and *described* by terminology distinguishing these universes of discourse is to beg an important question: "Within *what science* or *universe of discourse* is *this* claim substantiated?"

Plainly no hard and fast lines can be drawn between universes of discourse. Many established generic meanings—"overlappings"—are to be found. But failure to recognize at least the distinction permits one to "jump theoretical fences" or to "hop, skip and jump" around the various sciences to come up, possibly, with an assertion like this: "Learning is an affair in which the emotional strain between the orbit of Mars and the gold-holdings of France during any given fiscal year manifests itself in the mutation of genes of the Socialist State." Indeed, this is a rather extreme version of the very theoretic incomprehensibility of which some educational theory is accused. The problem is really one of locating and building a universe of discourse, a conceptual framework, or a commonly understood "system of meanings," *distinguishable* as *educational theory.*

Throughout his writings Dewey attempts to avoid—and he tells us as he does this—a misuse of symbols. His was

[8] John Dewey. *Logic: The Theory of Inquiry, op. cit.,* p. 111.

a *methodological* "system of meanings" as if to suggest that the quest for an educational discipline was one with the refinement and extension of methodological discourse. Sourced in Aristotle this discipline directs itself to those activities which exhibit and yield to, or are formed by, controlling agencies of a self-imposed sort.

Methodological discourse is distinguished by such concepts as *means, ends, methods, order, control, symbol* and *mediation,* as against, for example, biological discourse which is distinguished by such concepts as *organism, environment, reproductive organs,* and *mutation.* And since methodology aims at providing knowledge explicitly about activities and the manner in which they may be ordered or methodized, then it does hold promise of releasing the teacher in his professional capacity. Whatever the case, the "growth for the sake of further growth" criterion is helped only at the point of differentiations of method-of-science problems. No new principle can, thus far, be added to that of the method of science or critical thinking within the conceptual framework.

IV

In discussing *another kind* of intelligence and learning with methodological language, Dewey provides the means for the reconstruction and extension of his own theory and for the inclusion of another "growth" principle. He rejects as inappropriate such terms as *feelings, habits, emotions* and *attitudes* when describing what there is that is *more* than symbols, thus far conceived, yet *also* of thought and intelligence. He claims that we *think* qualitatively as well as "in terms verbal and mathematical." A case in point, he tells us, is the thinking that goes on in artistic endeavors. "The doing and making is artistic when the perceived result is of such nature that *its* qualities *as perceived* have controlled the question of production." [9] An end may be a quality and, "as perceived," it enters to "control" activity. That is, quality operates as an *end* and it operates as *method.* Further, "Thought that is artistic is as much a case of genuine thought as that expressed in scientific and philosophical matters." [10]

Now traditionally the term *quality* has been taken to signify a property, attribute or component of an object or event, e.g., "This apple has a red quality." Or it has been taken to signify a standard of excellence—a value criterion, e.g., "We mustn't sacrifice quality for quantity." But while honoring these meanings, Dewey is using the term within the context of methodology and thus attributing to it another meaning. However, it remained for some students[11] of Dewey to

[9] John Dewey. *Art as Experience.* New York: Minton, Balch & Co., 1934. p. 48. Elsewhere in his writings Dewey does equate the method of intelligence with the method of science and leaves the problem of accounting for the *more than this* that is yet human to psychology, sociology and biology. But the problem here is not to make Dewey consistent, nor to speculate what he "really" meant. Rather it is to develop a major theme in his writings which has been largely neglected.

[10] John Dewey. *Philosophy and Civilization.* New York: Minton, Balch & Co., 1931. p. 116.

[11] See particularly Francis T. Villemain, *The Qualitative Character of Intelligence,* Ed. D. Report (New York, Library, Teachers College, Columbia University, 1952); Villemain-Champlin, "Frontiers for an Experimentalist Philosophy of Education," in *The Antioch Review* (Yellow Springs, Antioch Press, Fall 1959); Joe Burnett, *et al.,* "Dewey and Creative Education," in *Saturday Review* (New York, November 21, 1959); and David Ecker, "Toward a Philosophy of Art Education," in *Research in Art Education* (Washington, N.A.E.A., 9th Yearbook of the National Art Education Association, 1959).

give the term further methodological precision, to link it up with Dewey's general theory of intelligence and learning and with the growth criterion.

According to this methodological extension of Dewey's thought, qualities, too, are symbols. In order to gain or have, for example, the quality we designate with the term "white," we must institute a relationship of contrast between that quality and some other quality. A relationship of contrast must be instituted in order that the "it" we label "white" be *present*. In common sense language we might say that if all were white there would be no white. Thus, qualities are symbols by virtue of constructed contrasts. A qualitative symbol is to be distinguished from a theoretical symbol by the fact that a quality *presents* itself by representing the relationship out of which it emerges or by *means* of which it gains distinctiveness. A theoretical symbol, on the other hand, can be had *without* its referent also being present. Such qualities as those designated by the terms "anger," "joviality," "indignation," "formality," "permissiveness," "Gothic," "Cubism," and "circus" are symbols. They require for their occurrence the construction of a relationship of contrast.

Quality operates as an *end*. An architect may seek to achieve a structure capable of being labelled "Classical." A dramatist may seek to gain the structure (himself) capable of being labelled "indignation." And a painter may seek a canvas capable of being labelled "Cubism." Quality as end may be termed "Total Quality."

Quality operates as *method*. In order to gain the quality we call "Classical," the architect is guided by a quality common to many structures yet distinguishably different from, say, the quality we term "Gothic" in its turn common to other structures. The drama student confronts the quality we label "indignation" as he confronts its occurrence in the cinema, on the stage, in the mirror or in the presentations of others and, *accordingly*, he institutes the relationships. So, too, with a painter who seeks the quality of "Cubism." This commonality or "pervasiveness" is regulative. It is method. It functions to guide selection and, hence, rejection of qualities and it functions to guide the relating in view of the end or total quality. Quality as method may be termed "Pervasive Quality."

Quality operates as *means*. In order to gain the quality we call "Classical," the architect selects as means such other qualities as horizontality, angularity, fluted column, and porch. The drama student presses into service a qualitative *kind* of voice, stance, gesture and term as means to gaining indignation. The painter utilizes a qualitative kind of line, plane, texture, color and proportion as means to the end called "Cubism." Conceived as means such qualities may be termed "Component Qualities."

Another principle of selection—qualitative method—may now join with the method of science under the "growth for the sake of further growth" criterion.

We may now locate descriptions of relationships between theory and quality —between theoretical intelligence and qualitative intelligence—for purposes of applying the growth criterion to curriculum construction. Four relationships may be noted: [12]

Theoretical Predominance is a case where theory is ordered to gain theory. (A child asks a question or seeks to answer a question; a philosopher gives a

[12] After Villemain.

lecture or writes an article; and a group undertakes a discussion.) In this case quality is an inescapable "background." That is, theorizing cannot go on save in a qualitative setting and along with such qualities as permissiveness, concentration or hesitation. In such cases qualities are to be evaluated in the extent to which they help forward the theorizing.

Qualitative Predominance is a case where quality is ordered to gain a quality but where there is theory functioning in an instrumental role. Theoretical symbols are to be found as children count and chant while skipping rope or bouncing rubber balls, as a "caller" functions at a barn dance or as one extends sympathy to another person. Theoretical symbols of one sort rather than another are pressed into service to help gain the quality of cynicism, depression, levity, frolic, friendliness, sorrow or a poetic form. In such cases theoretical symbols are to be evaluated in the extent to which they help forward the qualitative means-ends abroad in the situation.

Reciprocity is a case where both theory and quality function as means, ends and method. A bulletin board is a qualitative total, yet contains also theorizing in the form of information, descriptions or "copy." A dinner situation may involve those orderings of qualities we call manners and informality, yet be constitutive also of theorizing moving to conclusions about the present political state of affairs. "Group Process" in education is another illustration. In such cases both theoretical and qualitative methods constitute the controls, the means and ends.

Qualitative Independence is to be found in those means, ends and methods which entail no theorizing. A painting, sculpture, temper tantrum, a moment of affection, a whirling-dancing presence or a ripple of laughter in the classroom are cases in point. (Indeed, a person doesn't *lose* control when he becomes angry or "mad." He gains—employs—anger as a control.) In such cases only pervasive quality operates as the method.

Dewey's point to the effect that no experience can proceed without qualities is here joined with the contention that some experiences can proceed without theory. All teachers, then, are potentially art teachers. They become art teachers when they single out, point out to others, provide for or institute qualitative relations. Further, qualities must be *presented* in order to function as method—in order to be learned—in the classroom situation. Thus, in replacing the emotional theory, the theory of qualitative intelligence at once makes more exacting demands upon and more adequately releases the work of the professional teacher. The notion of "inner forces" inhibited, repressed or undeveloped, but nevertheless inside somewhere, is hereby replaced by the theory of qualitative method. Qualities are public and sharable. They are to be confronted, evaluated and re-composed, whether in the form of indignation, home life, "classroom atmospheres," or our cities.

V

The reconstructed theory of intelligence proposed above claims to join the problem set forth in the introduction. The amalgam of means-ends abroad in the human situation to be evaluated by the growth criterion may now be differentiated into: (a) theory to gain theory with quality in service; (b) non-theory or quality to gain quality with theory in service; (c) theory and quality to gain

theory and quality; and (d) quality to gain quality. This covers the full sweep of matters to be addressed by the growth criterion. Educators are brought that much closer to choosing and orchestrating the plethora of means-ends—learnings—in such a way that growth in one direction is seen in its relation to "continuing growth in new directions."

A creative curriculum would rest upon an esthetic foundation. For in the long haul Dewey would "award the palm," not to science, but to art experience. "Art —the mode of activity that is charged with meanings capable of immediately enjoyed possession—is the complete culmination of nature, and . . . 'science' is properly a handmaiden that conducts natural events to this happy issue." [13] And, "Esthetic experience is a manifestation, a record and celebration of the life of a civilization, a means of promoting its development, and is also the ultimate judgment upon the quality of a civilization." [14]

But a creative education in theory and quality carries with it the courage and responsibility to relinquish, if necessary, some of our current and, in some cases, closely guarded conceptions.

For, if the hypothesis herein advanced is tested and found to hold, then we must be willing to give up the emotional theory, the notion that art experience is restricted either to the "fine arts" or to departments of art education, the view that theory is of value only when it leads *immediately* to non-theory (practice) and the conception that removes from the domain of public education those qualitative moments of sympathy, sorrow, "celebration of ideals realized" so precious to shared living and so important to sustaining us during turning points in our personal lives. It remains to be seen whether or not we will pay the price.

[13] John Dewey. *Experience and Nature.* Chicago: The Open Court Publishing Company, 1929. p. 358.

[14] John Dewey. *Art as Experience, op. cit.*, p. 326.

Science and Mathematics

(Continued from page 27)

McCloy [12] stated the point well in his admonition to scientists and those who survive in a world of science:

You have to do more than sign an intermittent manifesto from the isolation of your laboratory demanding of the government some immediate course of action. It requires added knowledge, added reading, added thinking and added experience, all inspired by the scientific spirit. It requires dealing, incidentally, with subjects wherein the variables are apt to be far more numerous and baffling than in any scientific problem you have thus far encountered.

The implication is clear. Science does not end with logical analysis of the holes in knowledge, with the logical search for logical materials to be logically ordered. It involves a broader dimension of analysis, synthesis and recombination, all of which constitute creativity. Without such creativity, the atmosphere of science can at best be sterile and humid.

As stated by Charles Kettering, "Logic enables you to go wrong systematically." Creativity is the key to the escape from our older misconceptions.

[12] John J. McCloy. "Obligations of a Scientist." An Address at the 92nd Commencement Exercises of the Massachusetts Institute of Technology, Cambridge, Massachusetts, June 13, 1958.

The Importance of People

Column Editor: Prudence Bostwick

COLUMN EDITOR'S NOTE: *I'd like to say at the beginning that following Fred Wilhelms in the editorship of this column is going to be tough. When the invitation came, I had to wait a few days (or was it weeks?) and swallow hard before I could say I'd try.*

There isn't a reader of Fred's contributions to "The Importance of People" who doesn't regret the end of his two years of service. As the new editor I am scared and searching. This may be one reason why I have chosen newness as the theme for my first effort.

—PRUDENCE BOSTWICK

What Is It Like To Be New?

EACH autumn there is newness in the air—a strange thing to accompany the fall of leaves and the coming of October. For millions of us, however, children and teachers alike, the year begins after Labor Day, and for some the year is very new indeed. A child who is coming to school for the first time or a teacher who is beginning his career—these are the ones for whom the autumn world is fresh and zestful and sometimes terrifying.

In a way newness makes cowards of us all. The need to hang back, to cling to the familiar, to find old comforts and securities almost overpowers the basic human drive for adventure and for change. In spite of the delight in looking forward, often the "heart is down and the head is turning around."

It is at this time that someone who has been there before can support our wavering spirits. In spite of the fact that no one can learn for another, there is comfort in assurances that build increasingly justified confidence and give encouragement to a self threatened by events whose outcome is uncertain. Teachers who work with kindergarteners or other children or youth new to the school, and principals and coordinators who work with new teachers have special responsibility to provide continuous support and encouragement.

A number of years ago I had the opportunity of sitting in on a series of meetings in which a group of coordinators whose chief work was the induction of new teachers into a large city system met with one of the school psychiatrists to consider some of their professional problems. Over and over he stressed the need for the coordinators to remember that they were dealing with teachers new to their work and who were as much in need of constant reassurance as of food

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and drink. To illustrate his point he told of a man who had entered a hospital ward preparatory to an operation. During the evening he rang for the nurse. When she reached his bedside, he asked her for some assurance that he would be cared for, that death was not an inevitable consequence of his ordeal. At frequent intervals thereafter the man summoned the nurse only to ask the same questions again and again. Finally in exasperation the nurse inquired of the doctor in charge of the wards, "How often must I go to him?" and the doctor replied, "As often as the bell rings."

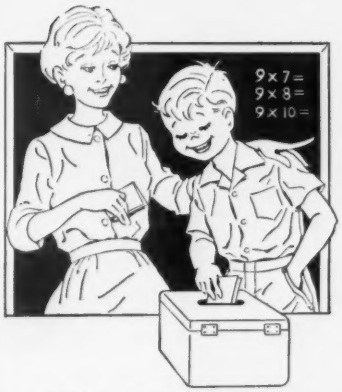
It is not enough for a new teacher to wait for his first salary check as concrete evidence of someone's recognition of his effort. He must have early support from those whom he regards as responsible for the evaluation of his work. To be sure he needs help in a thousand ways, but it must be given with recognition of him as a human being, with courtesy and with faith in his power to grow in professional competency. It must be given with understanding of what it means to be new.

It is this understanding that is difficult to achieve. Experience has a way of developing in us habits and skills which reach at last a degree of familiarity that helps us to forget the pain and excitement of the untried. Once we have become proficient in a skill or secure in a discipline or theory, we not only resist change in habitual processes, but we also tend to forget what learning was like. What we already know and what we can already do seem easy.

We whose business is helping other people to learn have a responsibility ourselves to undergo at frequent intervals the rigorous process of learning, to be confronted with the need to build new skills, habits, attitudes, and values which we have never built before. We need to know directly—not just remember—how it feels to explore a new city and be lost a block from home, to look on a new countryside, to live among people whose habits challenge ours, to gain a new skill, to learn a new language, to undergo the confusion that accompanies the rush of experiences before the configuration is achieved and the pattern clear. "We have lived so long," writes Arthur Combs, "with an accepted ability to write that we have forgotten how slowly and painfully the process of achieving these new differentiations was at the time we originally learned them."[1]

A number of years ago, in order to gain some insight into the nature of es-

[1] Arthur Combs and Donald Snygg. *Individual Behavior.* New York: Harper and Brothers, 1959, p. 191.



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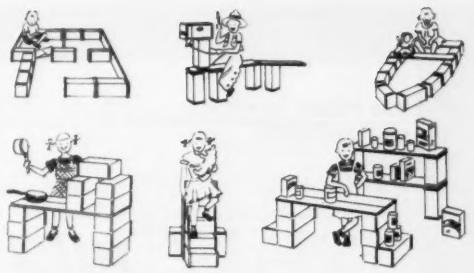
thetic experience I began to read such books as John Dewey's *Art as Experience,* Max Schoen's *Psychology of Music,* George Santayana's *Sense of Beauty,* Carl Seashore's *In Search of Beauty in Music,* and Irwin Edman's *Arts and the Man.* In the process I realized that I could not read the material which dealt with the esthetics of music. The language was outside my experience. I had never been a student of musical form, only a listener with profound emotional response, an enchanted layman. So it was that in order to enlarge my experience and my vocabulary, I began the study of piano with all the insecurities of childhood and none of its innocence. From a small, red book for children I learned to read the accompaniment to "The Three Little Kittens," "Mon Ami Pierrot," and "London Bridge" . . . a humbling process that taught me new respect for learning. I worked to understand some of the intricacies of musical notes and scales and their manifold interrelationships. Sometimes I would grasp their significance, but more often meanings were lost in the foggy whole from which I had not yet been able to differentiate them. Slowly I began to find meaning in the language of musical esthetics and to be able to accept with serenity the hypothesis that the "listener is reaching up, not for the opening of heaven, but for high G."

There are many reasons for tackling something new. Each of us feels the basic need for adventure. As we mature and our drive for physical adventure lessens (skin-diving, skiing down precipitous slopes, leaping chasms, conquering mountains), our drive increases for adventure in the world of the hand, mind, and heart. Some of us may work in clay, wood, metal, paint, or the soil of gardens. If we find our medium, we grow in power to create what we have seen in our mind's eye, to give form to meanings we have at first only partially understood. Or we may be caught up in the search for ways to improve the quality of our relations with other human beings, sharpening our perceptions, testing these perceptions with the "reality" of other perceiving selves, and growing in the ability to enter creatively into cooperative enterprises.

Or our adventurous spirit may take us to the frontiers of thought, to the moving edges of man's exploration of his world, whether of the earth and the space through which it is being catapulted, or of human behavior and its intricate expression. We may read *The Universe and Mr. Einstein* with a chance of seeing the universe newly. We may share in the research that has gone into



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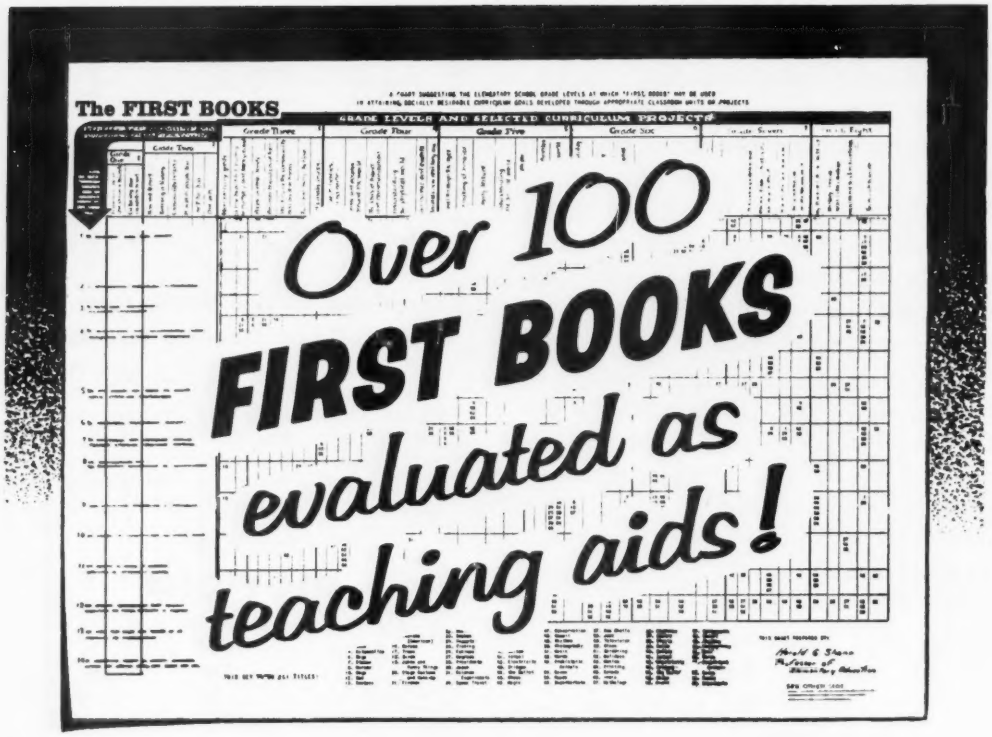

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the study of children's thinking or of their social values. We may, if our techniques are well sharpened, assist in the identification of new problems to be studied and the setting up of hypotheses and research design.

The invitation is everywhere to renew ourselves, to build new skills, to find new interests, to test out new ways of working and living. And in this renewing, we may grow in our understanding of the bewilderment that attends the effort to learn. We may appreciate the encouragement that comes from the support of others who know the way.

—PRUDENCE BOSTWICK, *Professor of Education, San Fernando Valley State College, Northridge, California.*

Creative Climate

(Continued from page 6)

advantageously through the intellectual reexamination of the problem and the trying of new solutions. The freedom from anxiety over being wrong without fear of social or emotional punishment leads to further attempts to solve the problem creatively.

Sixth, the teacher would not consider rote memorization or imitation of textbook thinking as good learning. This teacher, along with the text material, his own explanations, and all other resources merely supplies the facts from which each student will derive his own insights and arrive at his own possible conclusions. Some pupils may give some very naive and simple applications; others may supply quite thoughtful insights. Requiring that pupils confine their thoughts to what the textbook says or what teacher said is a certain way for producing conforming, non-thinking adults who may welcome anyone who will do their thinking for them.

Seventh, the teacher will provide procedures by which he can evaluate progress in learning that is commensurate with ability to progress. Instead of using every trial response by a pupil as a test of his knowledge, the teacher limits such testing to a specific time which culminates a learning period so that each pupil can try out many responses. The test consists of problem type questions to which each pupil can bring both the facts and, more important, his interpretation and evaluation of the facts. The teacher knows a mere listing of facts from memory is not a good evaluative device. Frequently, he will provide the facts and let the pupils solve problems of application or interpretation. But he does not limit himself to this. He uses oral reports, projects, acting out, debates, essays, and many other types of responses to provide for a wide range of creative abilities and understandings. By providing time for discussion and trial responses and certain specific times for interpretive types of testing, this teacher provides a beneficial climate for aiding creative efforts.

We need creative adults and democratic citizens who can think and feel free to think for themselves. The only way we can develop such citizens is to provide plenty of practice in a classroom where the climate is emotionally supportive rather than punitive. Give each child the freedom to learn by himself, with supportive guidance from the teacher, and you will have an adult who can think for and create by himself.

—ROBERT W. SCOFIELD, *Associate Professor of Educational Psychology, Oklahoma State University, Stillwater.*

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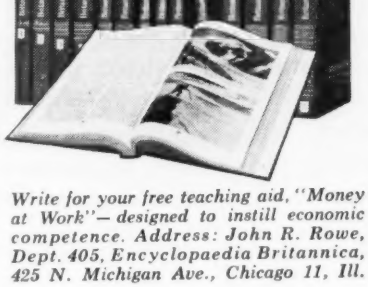

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Ideas into Action

Contributor: Walter B. Waetjen

NOTE: Initiated this month, Ideas into Action *will report frontier work by ASCD Commissions and Committees. Assignment of the commissions is to explore problems and issues in their areas of responsibility and to facilitate an exchange of ideas and information on these; that of the committees is to carry much responsibility in the business, organization and on-going work of the Association.*

These groups have an important function in furthering our professional growth. We hope this new department will serve as an effective stimulus to such growth.—R.R.L.

Myth and Fact about Learning

FOR the past several years the Research Commission of ASCD has sponsored a series of Curriculum Research Institutes, some of them in cooperation with the National Institute of Mental Health. Of late the Research Institutes have focused sharply on the factors that influence learning. That focus has by implication suggested certain myths or misconceptions held by many people about the learning process. In contrast, it has made explicit the "facts" about learning. Let us consider some of the myths and facts.

Myth #1. *The student learns what the teacher teaches.* Essentially, this notion about learning puts the learner in a very passive role since he must accept and absorb what the teacher sets forth to be learned. There are two assumptions in this myth that appear to be false. One of them is that what is significant to the teacher is equally significant to the learner; the other is that the quantity of facts learned is identical with the quantity of facts taught.

Fact #1. *Students cannot be taught directly, nor can we facilitate learning in the sense of making it easier.* Studies in perception demonstrate that all learning is selective. We perceive and learn what we purpose to. It becomes apparent that for a teacher to expect his meanings to be taken over completely by the learner is unrealistic since the learner is *selective* of what the teacher has presented. Learning begins with the learner, not with the teacher. But the teacher can make learning possible by providing information, materials and the setting. The greatest contribution he can make is that of listening to and encouraging the learner—in short, by being present in the full human sense.

Myth #2. *One has learned if he "knows."* To put it differently, if one has memorized facts, he has learned. An eighth grader will talk about the phylo-

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genetic scale even to the extent of using the term correctly to answer a test item. Yet if one were to ask him to tell what the term means he would be unable to say. Knowledge of the word had become the substitute for knowledge of the thing. The trap we can fall into is to believe that because one uses the proper vocabulary he has vision and insight—that he has learned. Students attest to the prevalence of this myth by asking questions such as, "What does the book say?" or "That's not what the teacher said." Believing in this myth reaps for us a bitter harvest. The learner comes to have little faith in his experience and in his ideas, for these are secondary to knowing the proper words.

Fact #2. *One has learned when he has experienced growth of the self.* Any other type of learning is transient and disappears when the external pressures are removed. It is this fact that presents the greatest challenge to teachers. The challenge is to build a "curriculum bridge" from that which interests (the self structure) youngsters to that which they should learn. To do this a teacher educates himself to ways in which he can ascertain aspects of the self-structure of youngsters and, in so doing, the teacher learns to respect and cherish the uniqueness of the learner. Frequently, the teacher discovers his own individuality in this quest.

When the learner experiences growth of the self in learning, he finds it unnecessary to surrender to authority and becomes more self-directing in future learning endeavors.

Myth #3. *Learning occurs through exposure to discrete curriculum areas.* Youths are required to learn by being placed in different subject matter classes for a certain number of minutes per day.

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It is even becoming commonplace for this type of organization of the school day to be found in the elementary school. One of the notable exceptions to this tendency is the ungraded or nongraded unit.

Finding themselves in classes organized along discrete subject matter lines, youths soon discover they must become expert at shutting off and turning on their learning. Since there is little attempt made by school personnel to have one segment of the school day relate to another, the student is forced into this "stop and go" type of learning. It is curious, indeed, that we seem to abandon youth at the time in learning when greatest help is needed. One of the most difficult tasks in learning is that of seeing relationships between seemingly discrete factors, yet we leave this task to the learner.

Fact #3. *Learning is integral.* It is not an acquisition of discrete elements. When a person learns he becomes a different person to some extent. By virtue of the fact that a new learning is integrated with older learnings a student comes to perceive, understand and think differently. When this type of integration of learnings has occurred, a person is in position for new learning to occur. Quite often, when a person learns through seeing relationships, his needs become illuminated to him—the road to future learning is opened. This means that learning does not always bring closure. As a matter of fact, learning seems to precipitate learning rather than terminate it.

It is not too uncommon to observe a person who has learned something of significance and to note the profound changes such learning precipitates. When he is not forced into compartmentalizing his learning, the person sees relationships, his behavior changes and his learning needs become clearer to him.

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Myth #4. *Only the intellect is involved in learning.* It is difficult to say whether more educators than lay persons subscribe to this misconception of learning. Many of the grading and grouping practices in education suggest that we believe in this erroneous notion of learning. Should a person believe in this myth about learning he would find it easy to apply a simple formula: mental capacity = the number of facts to be learned. The task of the teacher would indeed be less fraught with decision making if this were true.

If one embraces this myth he may be led down the garden path to the point where he finds it justifiable to blame and even castigate children for not learning. It would not matter that tension stemming from conditions in the home, at

school or with peers preoccupies one and stands in the way of his learning. As long as one has the intellectual capacity he will learn, saith the advocate of this myth.

Fact #4. *Learning is a complex process which includes the intellect.* School guidance personnel and clinical psychologists could offer an abundance of information to support this fact about learning. Their files are replete with cases of children who are quite able, intellectually, but whose personal lives are characterized by conditions that make them "learning cripples." These are the children referred to by the Australians as "homesteaders."

Research studies on underachieving children reveal that many factors are involved in learning. For instance, the general level of anxiety and the level of anxiety about testing situations have a pronounced effect on one's learning, regardless of intellectual capacity. Similarly, the research findings on the achievement motive suggest that intra-family relationships influence learning. To complicate the matter even more, boys appear to choose quite a different road for learning than do girls.

There is research to support the "Facts" mentioned above. It is nonetheless true that as educators we must learn to do the research we need to make our professional endeavors more precise. We cannot ask people from other disciplines to do this research for us. The educator will need to re-define his role to include the research function in order that he may discover more about the learning process and aid children in experiencing greater self-fulfillment.

—WALTER B. WAETJEN, *Professor of Education, Institute for Child Study, Univ. of Maryland, College Park; also Chairman, ASCD Research Commission.*

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Curriculum Developments

Column Editor: Arthur Hoppe

EDITOR'S NOTE: *A new column,* Curriculum Developments, *here makes its debut. The ASCD Executive Committee has given it a tough assignment. The column is "to report new developments in curriculum news, bulletins and research." It combines functions previously served by three departments, "Curriculum News," "Curriculum Bulletins" and "Curriculum Research."*

In fulfilling this triple aim, Column Editor Hoppe will need much help from his readers. He urges you to send him news items he should note; curriculum materials for possible review; and information on research studies that should be reflected in his column.

Your alert help can make this new department a signal service to the profession.—R.R.L.

A Curriculum Study Council

Twenty-one school systems have already joined the new Lakeshore Curriculum Study Council, Lakeshore Area, Wisconsin. The organization enjoys the stimulation and support of the School of Education of the University of Wisconsin at Milwaukee, and is open to all school systems in the state.

The Council is dedicated to the application of sound research procedures to problems of curriculum and instruction, and to the mutual sharing of research personnel, facilities and costs. Classroom teachers are relieved of teaching responsibilities to attend committee meetings of the Council.

Seven problem areas have been singled out for research effort:

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providing better quality education for more people. The Midwest Program on Airborne Television Instruction (MPATI) is one effort to meet this need.[1] It is a most ambitious experiment. Present plans call for a telecast from a high altitude airplane of 48 hours of course work per week, reaching six states in a radius of approximately 200 miles from Montpelier, Indiana. The Ford Foundation and private industry are supporting the project to the extent of seven million dollars. Telecasting will begin in February 1961 and will become a full-fledged comprehensive operation in the school year of 1961-62.

The MPATI experiment is being planned and managed cooperatively by an administrative staff, a council and several supporting committees involving representatives from 18 areas in the telecast region, each area including an institution of higher learning. During the summer of 1960, workshops were held at each of these schools to inform classroom teachers and administrators about the experiment. Simultaneously, at Purdue University, the carefully selected television teachers were working with curriculum specialists and other consultants in the preparation of courses of study. Forty percent of the courses are to be directed toward elementary grades, forty percent toward secondary classes and twenty percent toward college level. The subject areas to telecast include: art, foreign language, guidance, humanities, international relations, language arts, mathematics, music, science and social studies.

Television instruction is not new, and it does have potential value in bringing

[1] Further details appear in an illustrated brochure entitled, "Midwest Program on Airborne Television Instruction." The organization using the same name has offices in the Memorial Center, Purdue University, Lafayette, Indiana.

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rich and unusual experiences to large numbers of students. Over 500,000 public school pupils and 100,000 college students studied regular courses via television during the school year 1958-59. Thus, 569 public school systems and 117 colleges and universities used television for direct instruction. In the MPATI experiment, telecasting from a plane five miles high will permit a geographic coverage that includes many small towns and rural areas, and will offer elaborate instructional aids carefully planned to meet the needs of the learners involved.

The studied approach and the general procedures employed in this experiment may very well bring to light more certain data to aid in resolving various problems and issues related to television instruction. If, indeed, it can serve well the purpose of improving quality in education for large numbers of learners, airborne television warrants experimental attention.

New Bulletins

Michigan Department of Public Instruction. *A Statement of Basic Philosophy Regarding Public Education in Michigan.* Bulletin No. 364. Lansing: the Department, 1960. 11 p. (No price indicated.)

The Michigan Department of Public Instruction has restated and reaffirmed the basic philosophy under which the department operates. As Superintendent Lynn M. Bartlett indicates in his Foreword: "There is a fundamental desire on the part of citizens and educators alike to seek new ways and means by which there can be improvement in instruction and in curriculum." The Michigan group prizes local and democratic effort in program development; it sup-

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American Assembly of Columbia University, edited by Douglas M. Knight

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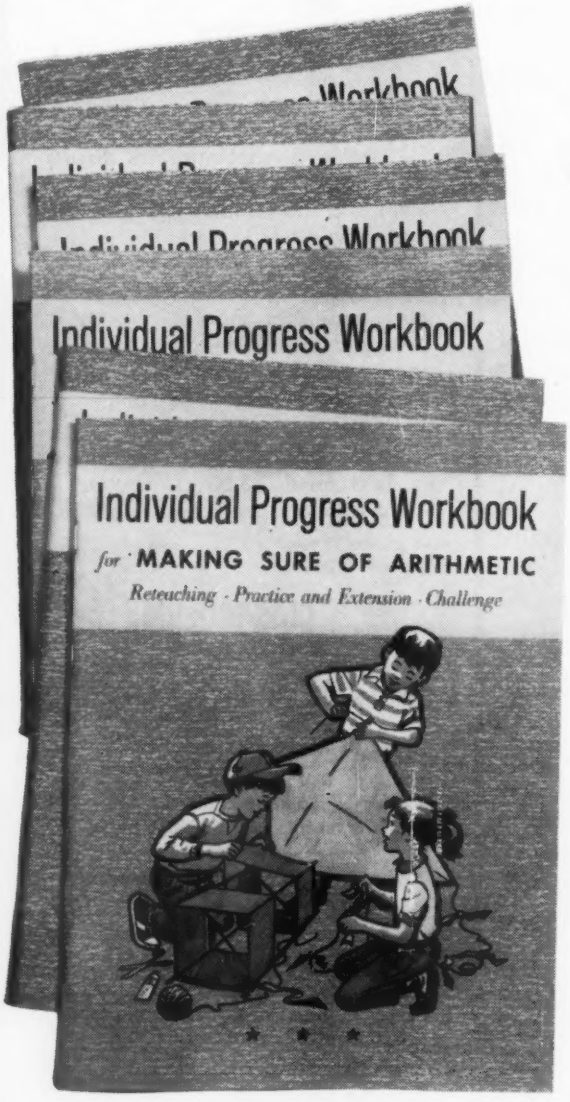
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San Bernardino County Schools. *Arithmetic for Today's Children and Youth*, Vol. III, Grades Seven and Eight. San Bernardino, California: Office of the County Superintendent, 1959. 188 p. (Price not indicated.)

Arithmetic teachers in grades seven and eight will surely welcome this guide.[2]

In one of the finest formats available, and in scholarly fashion, it incorporates a sound approach to the teaching of arithmetic and the latest ideas regarding grade placement. The guide contains many fascinating illustrations and a wealth of instructional materials. Students of curriculum will appreciate the flexibility of its guidelines.

A majority of the bulletin is made up of arithmetical understandings clearly described and assigned proper grade placement, together with numerous suggestions for developing the understandings. Following this is a substantial section on promising instructional practices. Therefore, in four major aspects of instruction—philosophy, content, procedures and resources—this guide repre-

[2] The preceding two volumes of this series of guides were designed for grades one through six and were reviewed in the December 1958 issue of *Educational Leadership*.

Modern Secondary Education

William M. Alexander,
George Peabody College for Teachers

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Recognized as a leader in its field, this basic text covers the principles and practices of secondary school education and analyzes today's special problems and challenges.

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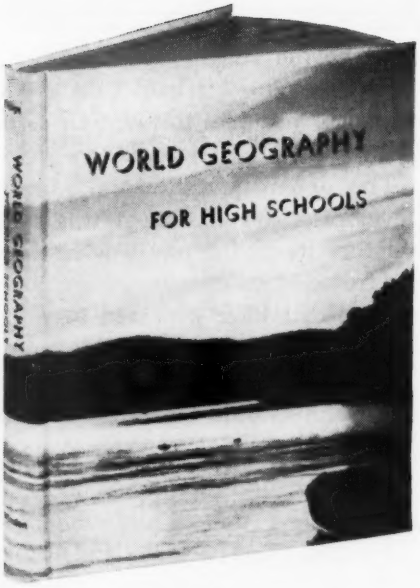

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sents an excellent product that should be vastly useful for teaching and learning arithmetic.

Long Beach Unified School District. *Outdoor Education.* Long Beach, California: Office of Curriculum Development, 1959. 88 p. (Price not indicated.)

Camp school experience was available to youngsters in Long Beach as early as 1948. Since 1953, all sixth grade children have attended camp school each year; and by 1959 over 29,000 pupils had enjoyed this opportunity. The original guide was composed in 1948; this one is the third revision. Groups that worked on the guide have been widely representative. They included central office personnel, camp personnel, school principals, the City Recreation Department, the Chamber of Commerce and the Parent-Teacher Association.

The bulletin was designed to help camp staff and classroom teachers improve the effectiveness of camping experience for youngsters, mainly through suggestions related to the pre-camp, in-camp and post-camp experiences of children. It presents clearly the objectives and organizational structure, a detailed breakdown of the outdoor education curriculum at Long Beach, several pages of very helpful bibliography and many audio-visual materials. The appendix includes an appropriate glossary of camp school terms; examples of various forms (for grouping campers or checking clothing, for example); and best of all, several practical examples of how the often neglected pre-camp and post-camp experiences might be developed. This bulletin is sound, interesting, concise, attractive, and extraordinarily useful. It is an excellent account of outdoor education.

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—Arthur Hoppe, *Associate Professor of Education, Indiana University, Bloomington.*

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Viewing education as part of the entire process by which a culture transmits itself across the generations, Professor Bailyn emphasizes the ways in which traditional European culture adjusted to the New World environment, tracing the role of such vital social determinants as family, denominationalism, race relations, apprenticeship, and the economy.

The first essay sketches the development of education during America's formative years and evaluates the existing writings on education in early American society. The second part of this pungent revision of American educational history is a bibliographical essay which presents, point by point, the gaps in our present knowledge, and suggests needs and opportunities for further consideration of the role of education in American history.

Both essays were presented in their original form to a conference on Early American Education held in Williamsburg, Virginia, in October 1959.

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Significant Books

Column Editor:
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Through Art to Creativity. ***Manuel Barkan.*** *Boston: Allyn and Bacon Inc., 1960.*

Through Art to Creativity is a book about children, their art, and the factors that affect its creation. Manuel Barkan, Professor of Art Education at The Ohio State University, has attempted to bridge the often very wide gap between theory and practice in art education. In order to do so Barkan has written a book which gives a running account of the activities within classrooms from the kindergarten to the sixth grade. Through various criteria Barkan selected 18 teachers from the midwest who were outstanding in their utilization of art within their respective classrooms. He visited these classrooms regularly, made tape recordings and took candid photographs of the teachers, the children, and the activities which developed. This narrative and visual data, together with Barkan's own analyses, were compiled into a book which provides readers with an intimate view of creativity as it unfolds through art activities in the classroom.

The book is divided into nine chapters. These chapters constitute five major sections dealing with art in the kindergarten, in the early elementary grades, in the middle elementary grades, and in the upper elementary school. The fifth section is titled, "What Is Good Teaching of Art?" The use of anecdotal records as a major source for a literary work is highly unusual for books on art education and indeed for the field of education in general. The method of using *actual* transcripts of human interactions is well known to the field of social work and has been used with great success in both the training and supervision of social case and group workers. As a method it has much to recommend it, for it makes stable that which is fleeting and evanescent.

The chapters are written in pairs. One chapter relates the things that occurred during the class period and is supplemented with photos. The dialogue is written verbatim as it came off the tape recorder so that the reader is able to savor the flavor of the atmosphere within each of the classrooms. In the following chapter Barkan builds up a theoretical framework in order to account for the behavior of the children.

Barkan's chapters on classroom analysis are divided into five sections: the developmental art achievements of the respective age levels, the content of the teachers' conversations, the teachers' use of class time, the use of classroom space and equipment, and the children's art work. While all of the chapters and sections would prove useful to new as well as experienced teachers, the section on children's art work should be especially helpful since it uses pictures of the actual art work as it is being produced and because it places its production in a spe-

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cific context. In this way the reader can "see the work through time."

While Barkan recognizes the need for art skills on the part of the teacher, he makes a significant case for the motivational and pacing aspect of art teaching. Analyzing one of the activities reported in the previous chapter he says:

> This rhythmic sequence served two important purposes: it provided shifts in tempo to vary the attention of the children; and it created a natural flow where the content of one activity provided the background for the development of the next one. Alternating activities which differ in tempo—such as dancing to listening to working—allow for relaxation and overcome tension. When the experiences in one activity contribute to the development of the next one, the sequence encourages cumulative learning.

By continually relating the described practices to theoretical scrutiny Barkan is able to identify the factors influencing the children's work in art.

In the final chapter of the book Barkan tries to tie together the conceptual strands that have run through its pages. He tries to identify the common facets of good teaching by identifying the common practices of good teachers. Barkan is quick to say that no single recipe for teaching exists. He claims each teacher taught artistically, that is, uniquely and with sensitivity. He believes, however, that good teachers shared common characteristics. They provided a wide life space for the children in their classroom, they encouraged flexible and unusual thinking by stimulating their imaginations, they knew their children and their level of development and endeavored to help the children discover their own conscious purposes for creating. Above all, these teachers knew where they were going; they had both a sense of commitment and a direction. *Through Art to Crea-*

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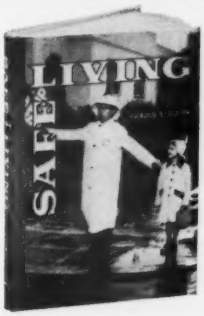

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tivity ought to be one of the most useful and lucid books written on art education.

—*Reviewed by* ELLIOT W. EISNER, *Instructor in Art, Laboratory School, University of Chicago.*

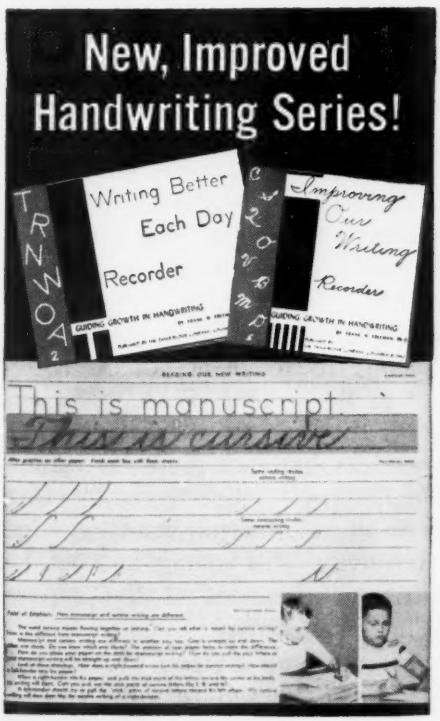
Teaching Music. ***Raymond Elliott,*** *Columbus, Ohio: Charles E. Merrill Books, Inc. 1960. 322 p.*

This well-written book is designed to present both the "how and what of music instruction at the elementary level." Although the emphasis is placed upon the correlation of music with other subjects, there is much in the book that is concerned with the teaching of music *per se.*

The author, long a leader in the field of education, has said that his book "should enable the reader (a) to grow culturally through a better understanding and appreciation of music; (b) to broaden horizons into other subject areas and thus be better prepared to present music to the elementary child; (c) to facilitate the preparation of units and lesson plans in order to bring music and social studies into a more comprehensive and meaningful whole; (d) to know how music relates to people and other areas of study."

This book has been divided into two parts. The first part deals with methods of teaching music. This section includes chapters devoted individually to singing, rhythm, reading music, creating, playing instruments and comprehensive teaching.

In Part II, the author supplies a prodigious amount of reference material. Here, he presents "a panoramic view of music as it relates to history in general and to people in particular." American and European history are traced simultaneously. In this way, the author re-



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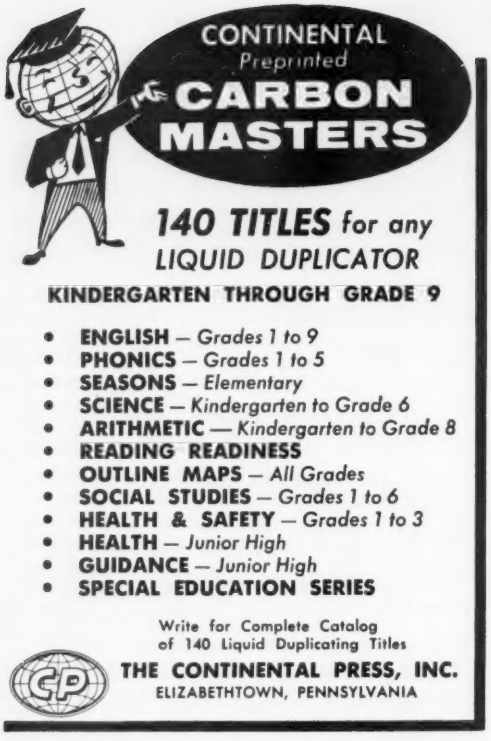
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veals how the events in a particular period may have influenced the composers and the folk and art material of that time. Here, too, are song and record lists, charts, pictures, interpretations of national characteristics in music, definitions of dance forms, sketches of outstanding composers, lists of leading personalities suggesting the achievements of a period, and much more.

This book would seem to be an excellent choice for use in college music education classes. It has everything in just about the right amount—philosophy, the history of music education, consistent references to child development, humor, ready-made subjects for discussion, methodology, excellent and abundant reference material and a fine bibliography.

Although much that is in this book has been said before, there is an advantage in having it all under one cover. In it, teachers and prospective teachers can find a wealth of material. Finally, in this book the classroom teacher can find that for which he constantly searches, "something practical."

—Reviewed by BERNIECE I. SMITH, *Director of Vocal Music, Cossitt Avenue School, LaGrange, Illinois.*

Creativity and Its Cultivation. *Harold H. Anderson, Editor.* *New York: Harper and Brothers, 1959.*

Creativity and Its Cultivation is essentially a collection of addresses given at the Interdisciplinary Symposia on Creativity at Michigan State University in 1958. This book is one of the most important on creativity since the publication of Ghiselin's volume, *The Creative Process,* in the early '50's. The problem of creativity has been approached from the standpoints of sociology, psychology, philosophy and education and the reader will find a wide array of ideas which will stimulate and tantalize his imagination. While the creative process has been of interest through the ages, only recently have research tools been used systematically to inquire into its nature. Both psychologists and philosophers have been quick to recognize the complexity of this task, for they have recognized its elusive (if not mysterious) character.

Mead, Fromm, Maslow, and Guilford are among the eminent authors represented in the volume. Each writer approaches the problem of creativity from his own bias, but each produces sections within the book which ought to prove basic to anyone interested in inquiring into creativity. This volume lays out the quality and character of the current thinking on creativity.

—Reviewed by ELLIOT W. EISNER, *University of Chicago, Illinois.*

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